

COMMERCIAL REFRIGERATION & AIR CONDITIONING

DO
YOU
KNOW
HOW
TO
HANDLE
THESE...

6 COMMON
CUSTOMER
COMPLAINTS

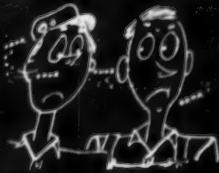
NOVEMBER 1956



NOT ENOUGH COOLING



MECHANICAL NOISES



ODORS ARE BAD



NOT ENOUGH HEAT



LOW HUMIDITY



FLOODED FLOORS

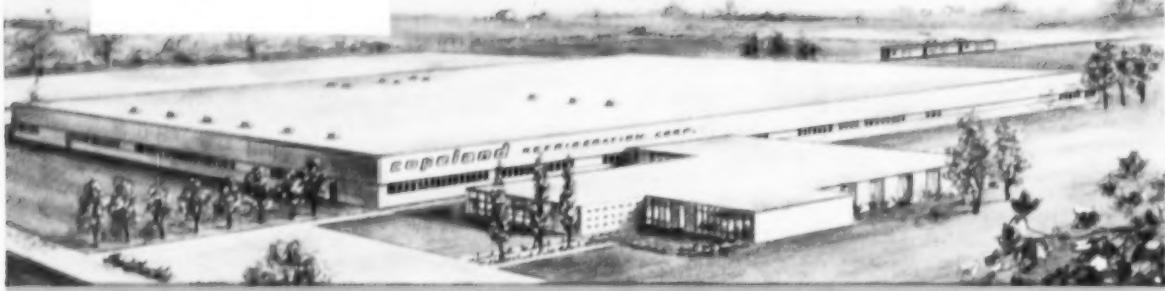


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MERCHANDISING, CONTRACTING AND MAINTENANCE OF COMMERCIAL,
RESIDENTIAL AND INDUSTRIAL AIR CONDITIONING AND REFRIGERATION

here's your future today...

Copeland's new 270,000 sq. ft. plant on a 75-acre tract in Sidney, Ohio, opens a new era for Copeland, its dealers and wholesalers. Enlarged and modernized facilities will provide more efficient service for our customers.



with *Copeland*



COPELAWELD
Heavy-duty performance at low current consumption.



BELT-DRIVEN CONDENSING UNITS . . .
Superior—engineered for every refrigeration need.



COPELAMETIC
The accessible hermetic . . . The industry leader for rugged dependability.



AUTOMOTIVE AND TRUCK COMPRESSORS . . .
Designed for the critical needs of truck and auto air conditioning and refrigeration.

Copeland's 38-year history is one of constant growth.

Our handsome new plant is only another step in a progressive tradition begun years ago. The bright future for air conditioning and refrigeration is opening up now . . . and the entire Copeland family—company, dealers and wholesalers—is ready with new facilities, new models and a new distribution policy geared to provide the kind of service that assures profitable business for all.

WRITE FOR DEALER INFORMATION

Copeland
REFRIGERATION CORPORATION, Sidney, Ohio

manufacturer of the heart of America's finest air conditioning and commercial refrigeration

Circle No. 1 on Reader Service Card



moisture-proof ALCO SOLENOID VALVES

NO COIL BURN-OUTS!

In low temperature, high humidity rooms . . . there's no danger of moisture causing failure.

Reason: The coils are impregnated with a special varnish making them moisture and corrosion resistant.

Alco Solenoid Valves are tight seating for positive shut-off. Easy to service without breaking electrical or line connections.

Alco Solenoids are manufactured by Alco to Alco's high standards.

Write for Condensed Catalog 20 and
Technical Bulletins 173 and 182

SEE YOUR ALCO WHOLESALER
... buy ALCO—buy QUALITY

Designers and Manufacturers
of Thermostatic Expansion
Valves; Evaporator Pressure
Regulators; Solenoid Valves;
Float Valves; Float Switches.



ALCO VALVE CO.

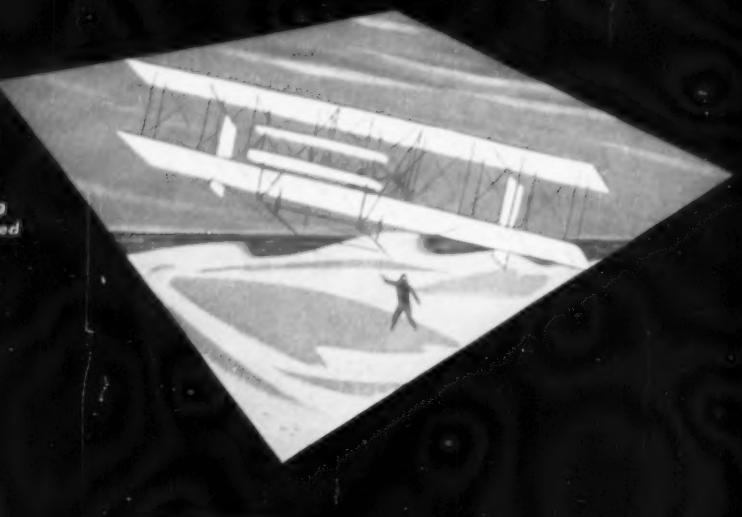
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7007

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1906

Wilbur and Orville Wright's historic engineering achievement was only three years old in 1906 . . . the year marking introduction of the first Brunner-engineered product.



TODAY Brunner offers you the most profitable sales combination in the refrigeration industry:

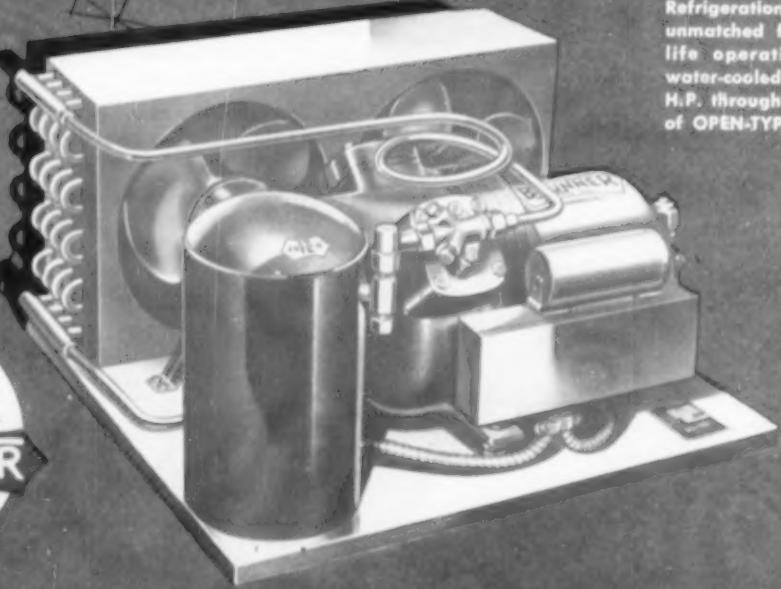
**ADVANCED ENGINEERING
BIGGEST DISTRIBUTION NETWORK
FAST WARRANTY SERVICE**

THE BRUNNER COMPANY, GAINESVILLE, GA.

Brunner Manufacturing Company, Utica, N.Y.

In Canada: Brunner Corp. (Canada) Ltd., Toronto, Ontario

BRUNNER-METIC semi-hermetic Refrigeration Condensing Units are unmatched for dependable, long-life operation. Air-cooled and water-cooled models . . . from $\frac{1}{4}$ H.P. through 3 H.P. Complete line of OPEN-TYPE UNITS from $\frac{1}{4}$ H.P. through 100 H.P.



COMMERCIAL REFRIGERATION & AIR CONDITIONING

READER'S GUIDE

NOVEMBER 1956 • VOLUME 13 • No. 11

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- 44 **ICE MAKERS NEEDN'T BE A SERVICE PROBLEM** . . . if a proper program of preventive maintenance is employed. Here's how to do it, step by step.
- 45 **SERVICEMEN DOUBLE AS DEMONSTRATORS** . . . for this Kentucky dealer who believes in getting maximum returns from every name on his payroll.
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THE MODERN REFRIGERANT METERING DEVICE

"STRAIN-O-KAP"®

An unexcelled strainer-capillary tube combination: and it is COMPLETE—all in one.

NO guess work, NO adjustments, NO cutting; install Strain-o-kap as is on any equipment* and get 100% results.

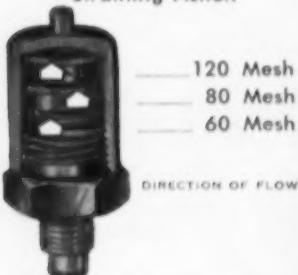
REPLACES:

- High side float
- Low side float
- Restrictor tube
- Original capillary tube
- Expansion valve

*For Sealed and Open Units.
Refrigerators 1/20 to 1/5 H.P. inclusive
Water Coolers 1/4 H.P. and less.
Freezer Cabinets 1/3 H.P. and less.

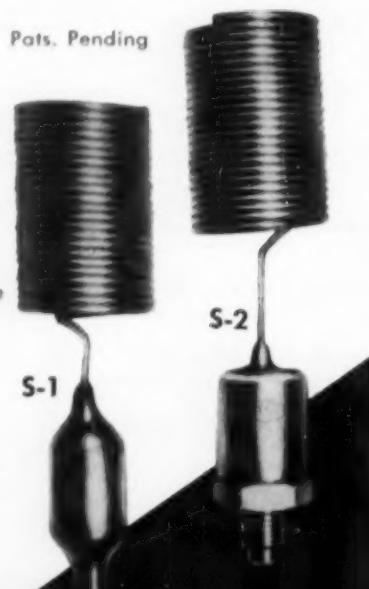
For use with SO₂, Methyl Chloride, F-12, F-21, F-22, F-114, Carrene and Methyl Formate.

Strain-o-kap Features Triple Straining Action



Note: this cut-away drawing shows the highly efficient triple straining action of the three monel screens.

Pats. Pending



- Just one size for all units
- Three Monel Mesh strainers
- Less Capillary Noise
- Individually Tested and Calibrated for proper pressure drop
- Precision, hand drawn, Capillary tubing
- Baked and Individually packed in heat sealed, moisture proof containers
- Guaranteed Satisfaction



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HIALEAH, FLORIDA

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General Electric air conditioners make it easy to do business

easy to sell...

So easy to install—no work-stoppages or serious alterations. Big jobs can be done step-by-step. *Floor models* can be installed in-space or out-of-space. *Ceiling-mounted models* need no floor space, include water-cooled and air-cooled units.

easy to finance...

General Electric offers the most attractive financing plans in the industry, including the following...

INVENTORY PLAN. Carry as many G-E units as you need on your floor or in your warehouse until July 31st—you invest only 10% of the purchase cost.

INSTALLATION PLAN. You get your equipment cost when customer signs order—and balance of selling price after installation is completed. Your working capital goes further—your credit remains good—and you pay no interest charge.

FOUR CUSTOMER-PAYMENT PLANS. 1. Easy Payment Plan for customers low on cash. 2. Skip-Payment Plan for more pre-season sales. 3. Pay-As-You-Profit Plan with payments during hot months when G-E units are in use. 4. Earned Depreciation Plan with longer, more flexible terms for large installations.

easy to service...

In fact, no service at all on cooling system. Motor, compressor and condenser are sealed by flame to keep dirt and moisture out, vital refrigerant and oil in. Entire refrigeration system is covered by General Electric's unsurpassed 5-year warranty. Call your G-E Packaged Air Conditioner Distributor for full story of a G-E Dealership, or write: C. J. Rigby, General Electric Company, Commercial & Industrial Air Conditioning Dept., 5 Lawrence St., Bloomfield, N. J.



packaged AIR CONDITIONERS

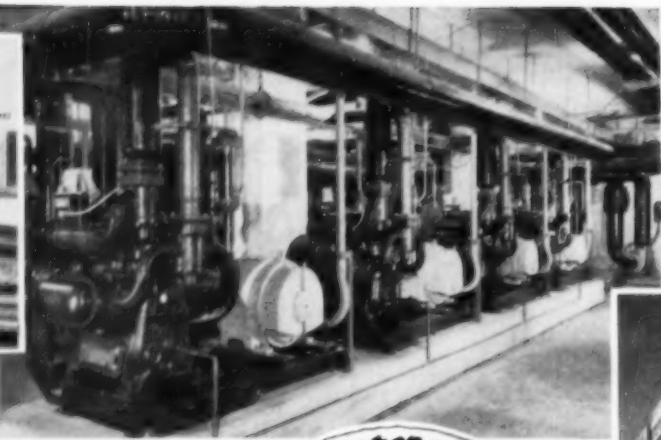
Progress Is Our Most Important Product

GENERAL  **ELECTRIC**

Circle No. 6 on Reader Service Card



Frick unit air conditioners are built in 3, 5 and 7½ horsepower sizes.

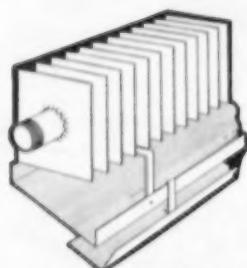
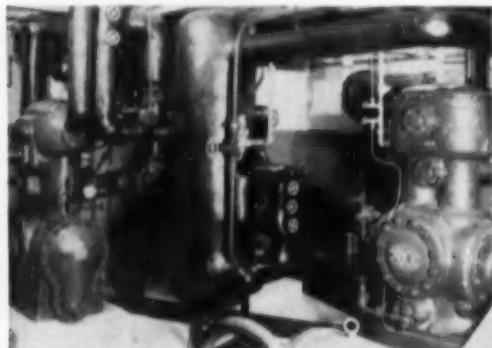


Eight Frick "ECLIPSE" compressors, each with nine cylinders, air condition both the 11-story buildings of the American National Insurance Co. in Galveston, Texas.

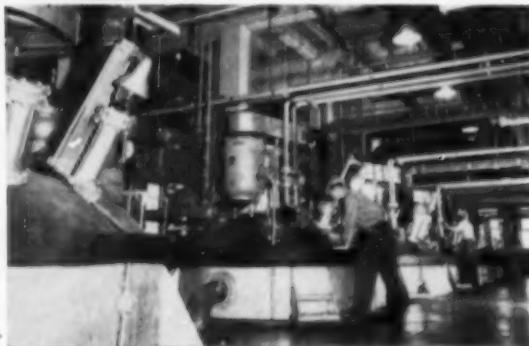


Fragmented Shell-Ice is produced automatically; plants making block ice available in any size.

Below: Ammonia booster systems save power on quick-freezing work.



Frick square and spiral finned pipes save valuable space.



Air Conditioning and Refrigeration

The Industry's Most Complete Engineering Service

Including surveys, sales-engineering, design, manufacture, shipment, installation, and maintenance.

Built into Frick equipment are 50 years' experience in air conditioning, 74 in refrigeration, and 103 in engineering. Nowhere else can you get this combination of unique engineering experience, complete systems and complete service —on any commercial or industrial cooling load, with any refrigerant, at any temperature!

Branches and distributors the world over: write for literature and estimates today.



Synthetic-rubber reactors handle batches over twice as fast when cooled with patented Frick coils.



In writing for literature, please describe the cooling work you wish to do.

Defrost Electrically

SAFELY... SURELY

with DUNHAM-BUSH
'ED' UNITS

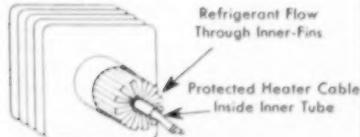
NOW FEATURING

**Mechanically sealed
HEATING ELEMENTS**



DRAIN PAN HEATING PAD

Conductive rubber electrical heating blanket provides quick, safe heat that prevents refreezing of water during defrosting. No heating wires . . . heating element is conductive rubber, hermetically sealed, shockproof and waterproof.



No defrost problems with these Dunham-Bush low temperature units! Mechanically sealed heating elements provide positive protection against entry of water into system. Defrosting is safe . . . sure . . . complete. And control kit (furnished) makes defrosting entirely automatic.

Inner-Fin® coil construction, exclusive with Dunham-Bush, permits units to defrost from the inside. Heat source for defrosting is a specially designed heater cable contained within the inner tube. Greater surface area which Inner-Fin construction provides assures rapid distribution of heat, quicker defrosting and minimum room temperature rise.

Units are available in capacities from 4500 to 36000 BTU/hr.

Write for complete information.

Dunham-Bush, Inc.

WEST HARTFORD 10 • CONNECTICUT • U. S. A.

DUNHAM-BUSH

AIR CONDITIONING, REFRIGERATION, HEATING PRODUCTS AND ACCESSORIES

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& AIR CONDITIONING • NOVEMBER, 1956

NOW

OIL SEPARATION AND
SYSTEM SILENCING
ENGINEERED INTO
A SINGLE UNIT



the HEAT-X 'OSM' OIL SEPARATOR-MUFFLER

heat-x

Silencing is more than just incidental and partial with Heat-X 'OSM' Oil Separator-Mufflers. These units were specifically engineered to completely silence all system noises and absorb all pulsations from the compressor . . . in addition to separating entrained oil.

And these "all-in-one" units make float troubles a thing of the past. 'OSM' Oil Separator-Mufflers have no floats to hang open or stick closed. Instead, units incorporate a positive action Velocity Pressure Mechanism, exclusive with Heat-X, which opens only when compressor is running . . . closes of its own weight when compressor stops.

Ratings based on tonnage, not horsepower, permit close matching of unit to requirements . . . eliminate need to buy more than required capacity.

Ruggedly constructed to A.S.M.E. specifications. Available in capacities from 1 to 75 Tons F-12 and 1 to 100 Tons F-22.



REQUEST FREE DESCRIPTIVE CATALOG.

HEAT-X, Inc.

BREWSTER • NEW YORK

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by Albert Woodruff Gray

Legal problems are an inherent part of operating any business enterprise. If you are beset by them, you'd better talk to your lawyer. This column, which appears periodically in the issues of COMMERCIAL REFRIGERATION AND AIR CONDITIONING, in no way aspires to serve as legal counsel for our readers. It is prepared, however, by a man well versed in legal practices and opinions, and by presenting digests of actual court cases involving commercial refrigeration and air conditioning dealers and contractors we hope to enable our readers to sidestep some of the legal pitfalls into which they otherwise might unwittingly stumble.

—The Editors

COUNTER PROPOSAL TO BID RULED NO CONTRACT

BIDS for the installation of air conditioning equipment in its office building were advertised for by the Alabama State Docks Commission. In response to the advertisement a contractor in Mobile submitted a bid of \$35,851. In that bid he stated, "We are using Carrier equipment throughout." That equipment consisted of a high speed compressor and a galvanized evaporative condenser.

In the letter accepting this bid it was stated, "The compressor shall be of multi-cylinder reciprocating type, slow speed, belt driven. Also the condenser shall be constructed entirely of stainless steel with the exception of fan shaft, wheels and scrolls."

When the contractor gave notice of his withdrawal, he was advised that a subsequent bid for the work was \$38,617 and that he would be held liable for the payment of the difference between the amount of this bid and his own.

In the lawsuit that followed, the Alabama court held that no liability rested on this contractor for his refusal to undertake this commitment.

"The rule is that the minds of the parties must meet as to all the essential features of a contract. The letter to this contractor with the enclosed document, which is supposed to be an acceptance of the bid, specifies that the contractor must comply with the specifications. This was in

If your prospect
acts like this



suggest
time payments



to close the
sale



TODAY the demand on working capital is heavy. To keep their cash and usual lines of credit for current operations, more and more of your prospects prefer to finance their purchases of major equipment. Our tailor-made Refrigeration Equipment Plan can help you

build prestige and close sales. Be sure your proposals are complete by including information about buying on the nationally popular COMMERCIAL CREDIT PLAN. Call our office in your city or write COMMERCIAL CREDIT CORPORATION, 14 Light St., Balt. 2, Md.

COMMERCIAL CREDIT CORPORATION • A service offered through subsidiaries of Commercial Credit Company, Baltimore . . . Capital and Surplus over \$190,000,000 . . . office in principal cities of the United States and Canada.

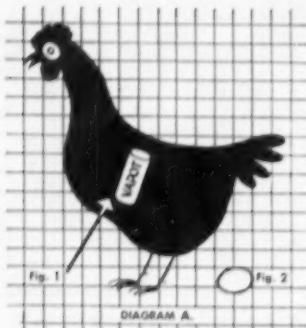


Diagram A, above, represents a device used in egg production. The technical word for it is hen.

Components are fed into a hopper, gulleted, conveyed to a processing room and thence to a packaging department. The end product (Fig. 2) is known as an egg.

How it got to be an egg doesn't interest egg buyers. Egg buyers just want eggs. Good eggs.

And users of refrigeration want refrigeration. Good refrigeration.

However, one of the working parts of most soundly engineered hens is something the name of which escapes us at the moment, but it corresponds to **VAPOT**. (Fig. 1.)

In a simple ice cream storage box or in the complex refrigerated hold of a ship, **VAPOT** is a small not-too-costly working part. It defrosts. Quickly and at the right time it dispels frost and ice without raising temperature detrimentally. There are alternate devices that defrost. We can quickly prove that **VAPOT** defrosts faster with less rise in temperature and that it reduces the cost of refrigeration.

If you build, sell, buy, design or install refrigeration you will be astounded when **VAPOT** is explained to you and/or your engineers. Architects should find out about it too.

VAPOT is one of many specialties used in refrigeration and air conditioning . . . made by us.



REFRIGERATION ENGINEERING, INC.
7230 E. Shawmut Ave., Los Angeles 32, Calif.

Phone: Raymond 3-2381

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10

effect a counter proposal eliminating the Carrier equipment.

"To be a contract therefore, the contractor must accept the counter proposal. Instead of accepting the counter proposal and signing the preferred subcontract, the contractor wrote, in effect, that he was unable to accept the counter proposal and withdrew his bid. There was never a meeting of the minds."

Air Conditioning Engineers v. Small, 65 So. 2d 698, Alabama.

LIQUIDATED DAMAGES RULED UNLAWFUL

SUIT was brought by the purchaser of air conditioning equipment for use in a New Jersey restaurant for liquidated damages under a provision in the sales agreement. As an offset to this the dealer set up as a counter-claim the sum of \$11,400 that was still unpaid by the purchaser under his contract.

The provision for these liquidated damages claimed here by the buyer was that the dealer should pay \$100 for every day after the date stipulated for the completion of the installation, as damages for delay. These damages the court refused to allow, and said in awarding the dealer a judgment for the unpaid balance on the contract.

"It seems clear that this amount was not based upon damages which would likely flow from a breach but is rather an arbitrary figure unrelated to such damages or losses and was therefore a penalty. The policy of the law is to allow real damages only. If the contract provides damages which will exceed real damages as same may be ascertainable or damages which are unreasonable or excessive under the circumstances, the same are considered as penalties and unlawful."

218-220 Market Street Corp. v. Kirch-Radisco, Inc., 11 A.2d 109, New Jersey.

USE OF EQUIPMENT AFTER REJECTION

IN a contract for the purchase of a refrigerating plant, the capacity was guaranteed to be equivalent to the melting daily of 225 tons of ice. In the contract there was also the provision, "After the plant is started we will furnish an engineer to have charge of the operation of the machine for ten days. At the end of the above mentioned ten days you shall accept or reject the plant, it being understood that if it shall meet the requirements of this proposition it shall be accepted."

All the difficulties that had occurred in setting up the plant and putting it into operation were remedied by the contractor. During that time and afterwards the purchaser continued to use the equipment until suit for a re-

covery of the price agreed upon was brought when the purchaser contended that notice had been given of its rejection of the plant and that it had no liability for the payment of this price.

In its award of judgment to the contractor for the unpaid balance under this contract, the court said,

"The test was completed, the dealer had withdrawn its engineer, claimed to have performed its contract and was demanding payment. The plant was then tendered in satisfaction of the contract. If it conformed to the contract the purchaser was bound to accept it. If it did not substantially conform to the contract the purchaser had the right to accept or reject it, at its option. If it chose to retain and use the plant it thereby accepted the ownership of it."

"Any act done by the buyer of goods tendered in fulfillment of a contract of sale, which he would have no right to do if he were not the owner, constitutes of itself an acceptance of the goods."

Fred W. Wolf Co. v. Monarch Refrigerating Co., 96 N. E. 1063, Illinois.

DEALER HELD LIABLE FOR SERVICEMAN'S NEGLIGENCE

REFRIGERATING equipment had been installed in an Alexandria, La., sandwich shop and lunch counter. After making repairs, an employee of a refrigerator dealer left a bottle of concentrated ammonia on the lunch counter. A customer sitting on a stool directly in front of the bottle moved it to one side. The bottle exploded throwing the alkali into his eyes and face.

In affirming a judgment for \$2,750 against the dealer the Louisiana appellate court said, "The ammonia solution was a volatile gas forming liquid liable to explode when left in a warm place. The dealer's employee was charged with this knowledge and his duty was to exercise a degree of care in handling this dangerous article that was commensurate with the dangerous character of the article and in such a manner as not to endanger persons who might come in contact with it."

"The negligence of the serviceman of this dealer in placing the bottle on the counter and going away and leaving it there was the sole proximate cause of the accident and the dealer is liable for the damages to this customer caused by the accident."

Norton v. Louisiana Ice & Utilities, Inc., 135 So. 717, Louisiana.

DEALER'S RESPONSIBILITY

IN the establishment of a plant for ice milk products a buyer in Tennessee contracted for the purchase of an automatic freezer. When he asked

**ATTENTION
SERVICE ENGINEERS
SERVICE SHOPS!**

CHARGE IT...

... WITH A
Kinney
**PORTABLE
SERVICE
STATION!**

HERE'S YOUR CHANCE to duplicate original equipment (household refrigerators, home freezers, air conditioning units, etc.) manufacturers' exacting CHARGING specifications with portable service stations that put more profit into your servicing jobs. These fully mobile units provide production-line performance during reconditioning . . . with adequate evacuation and dehydration assured by a high-precision vacuum system.

KINNEY MFG. DIVISION
THE NEW YORK AIR BRAKE COMPANY 
361 WASHINGTON STREET • BOSTON 38 • MASS.
INTERNATIONAL SALES OFFICE 90 WEST ST., NEW YORK 6, N.Y.

- Please send Brochure describing Kinney Portable Service Station and Accessories.

Name _____ Title _____
Company _____
Street _____
City _____ State _____

Design offers a quick and visible means of accurately charging refrigerants as well as, when desired, other supplementary liquids. Integral design assures leak-proof operation of all components . . . Kinney Model KC high vacuum pump, Freon cylinder holder, calibrated charging board, and leak-free vacuum manifold.

These high quality, dependable units reflect Kinney's years of leadership in the vacuum field. Request complete data today . . . or contact any of our competently staffed district offices . . . in Baltimore, Charleston, W. Va., Charlotte, N.C., Chicago (La Grange), Cleveland, Detroit, Houston, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, San Francisco, St. Louis, or The International Sales Office, 90 West St., New York 6, N.Y.

write today!

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EASY-FLO 45

meets
ALL
these
requirements
for
brazing
refrigerator
seal



DISSIMILAR METALS:

A cast-iron washer must be joined to a half-hard .008" brass bellows.

GAS TIGHT:

Brazed joint must be 100% gas-tight.

HIGH PRESSURE:

Joint must stay gas-tight under 250-300 lbs. pressure psi.

SERVICE ABUSE:

Joint must withstand considerable vibration and twist in operation.

NON-CORROSIVE:

Brazing alloy must be absolutely corrosion resistant to refrigerant.

These are the production requirements encountered in brazing this assembly, part of a bellows-type seal for the pulley end of the refrigerator compressor shaft of automotive air conditioners. Crane Packing Company meets them all with EASY-FLO 45 and HANDY FLUX as simply and speedily as this:



Bellows and washers are dipped in HANDY FLUX



An EASY-FLO 45 flat ring is placed on each bellows. Cleaned cast iron washers are placed on top of the EASY-FLO rings. Assemblies are loaded on jig and induction-brazed, 4 at a time—in 21 seconds.



After brazing, water from a spray gun is sprayed over assemblies to remove flux and protect temper of bellows. All done with EASY-FLO and one operator.

GET COMPLETE EASY-FLO FACTS AND DISTRIBUTOR LIST.
BULLETIN 20 explains why high-strength, speed and economy are inherent in EASY-FLO brazing. Also gives Handy information about joint design and fast brazing methods. Get your copy, with distributor list, by writing today.



Your NO. 1 Source of Supply and Authority on Silver Brazing Alloys



HANDY & HARMAN

General Offices: 82 Fulton St., New York 38, N. Y.
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MONTREAL, CANADA

the dealer for his advice he was recommended this freezer. Upon the payment of the purchase price of \$2,580 he received a bill of sale on which was endorsed,

"The seller agrees with the purchaser hereof that if the product or products above described shows or develops any mechanical defects within the period of one year from the date of purchase it will service and replace all such defective parts free of charge, providing no alterations are made on the product and the product is used and operated under normal conditions, and the seller is given immediate notice of such defects, and the correction of such defects by the seller shall constitute a fulfillment of its obligations to the purchaser."

When the machine failed to operate as he had anticipated, the buyer sued for a recovery of his money and a cancellation of the contract. In its decision in favor of the purchaser, the Tennessee court said, "While it must be conceded that the buyer does not make out a very strong case with regard to the representations made by the dealer as to what the freezer would do, yet when we consider all the facts and circumstances, together with the literature that was furnished him, we are impressed that he relied on those representations in making his purchase."

"The dealer was in the business of selling this kind of equipment and was in much better position to know about the qualities of his product than was the purchaser."

Huddleston v. Lee, 284 S.W.2d 705, Tennessee.

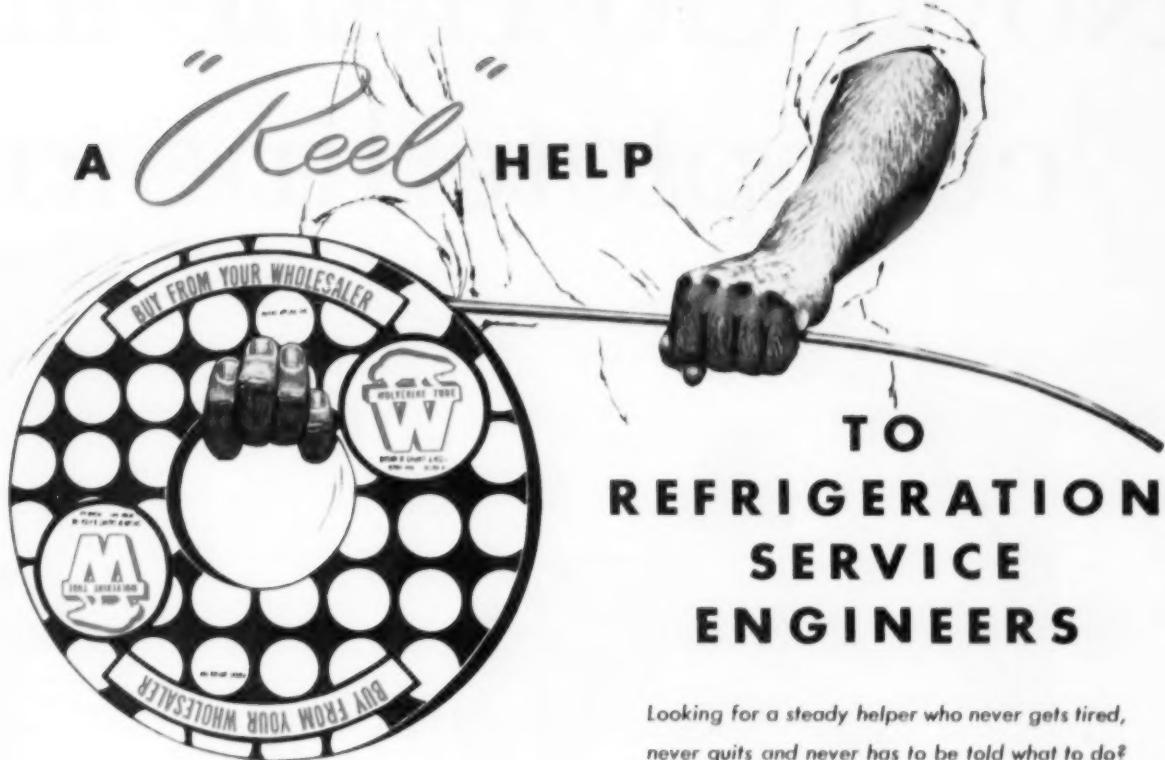
HEADS AIR GROUP

Nathan A. Gardner, manager of air conditioning and refrigeration sales, Export Dept., Worthington Corp., has been elected chairman of the foreign trade committee of the Air Conditioning and Refrigeration Institute.

HERMIDIFIER WILL MAKE AND SELL DAFFIN UNITS

All rights to manufacture and distribute Daffin humidifiers have been sold by Daffin Mfg. Co., of Lancaster, Pa., and the Lancaster Engineering Corp. of Hazleton to the Hermidifier Co. of Neffsville, Pa. The transaction includes all inventories of completed units and spare parts as well as manufacturing tools and materials.

According to Paul A. Herr, president of the newly formed Hermidifier Co., there will be no interruption in delivery of Daffin units or spare parts to distributors.



TO REFRIGERATION SERVICE ENGINEERS

Looking for a steady helper who never gets tired,
never quits and never has to be told what to do?

Wolverine Tube has the answer! It's Wolverine Roll-O-Tube®—copper refrigeration tube in the modern, round carton designed to make your work easier.

For example, try using Wolverine Roll-O-Tube as a reel. All you have to do is reel off the length of tube needed and leave the rest in the carton—protected against damage and dirt until wanted again.

Roll-O-Tube helps you in other ways, too. It has a convenient center hole for easy carrying. Large size type speeds identification and a gummed tape around the outer edge provides a zip-quick opening.

Wolverine refrigeration tube also features the industry's most modern tube seal. Here is real convenience—a plastic plug that can be used over and over—that is easy to insert and withdraw—that lets the tube be readily threaded through partitions—that gives positive sealing against moisture and dirt.

Next time you visit your wholesaler ask for Wolverine Roll-O-Tube by name. You'll get the finest of copper refrigeration tube and the finest of helpers—both from the same carton. Wolverine Tube, 1405 Central Avenue, Detroit 9, Michigan.

BUY FROM YOUR WHOLESALER

DIVISIONS OF
CALUMET & HECLA, INC.

CALUMET DIVISION
WOLVERINE TUBE DIVISION
CANADA VULCANIZER
& EQUIPMENT CO., LTD.
FOREST INDUSTRIES DIVISION
GOODMAN LUMBER CO.



WOLVERINE TUBE

Division of Calumet & Hecla, Inc.

Manufacturers of Quality-Controlled Tubing and Extruded Aluminum Shapes

PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES.

EXPORT DEPT., 12 E. 40TH ST., NEW YORK 16, N.Y.

Circle No. 14 on Reader Service Card

5660

Now! Go Trane all complete line of



TRANE Self-Contained Air Conditioner, as shown in SATURDAY EVENING POST advertisement.

They're trim! They're slim! They're quiet! And they're packed with features that help you sell!

The compact 3 through 15-ton deluxe models pack maximum cooling comfort into a sleek, modern cabinet. Easy to install in store, shop or office; no interruption of your customer's business. Exclusive "no-sound" design has fan section and compressor section floating independently on sound and vibration isolators for whisper-quiet operation!

Easy-to-install 10-15-20-ton commercial sizes for your larger jobs—these big capacity packaged air conditioners will help you get those profitable larger commercial and industrial jobs. Can be installed outside the conditioned space, for use with ductwork. Available with or without built-in water saver.



the way with a packaged units

Self-Contained units from 3 to 20 tons make TRANE the most complete air conditioning line in the industry!

Your customers will like these trim, slim packaged air conditioning units—and you'll like doing business with TRANE! You'll have the finest line of air conditioning equipment in the industry—with no problems of line limitation, order quotas or warehousing.

TRANE packaged units are competitively priced, with a 5-year TRANE Warranty—and, best of all, they're backed by the complete TRANE line that puts you in the air conditioning business *all the way*. You'll have a complete line of equipment to handle any size—any type—of air conditioning job!

Ask your TRANE Sales Representative now about all the extra advantages you'll have as a TRANE Authorized Dealer—or write TRANE, La Crosse, Wisconsin.

Here's why it makes sense for you to turn to TRANE

- **Most complete line** of equipment in the industry! Competitively priced equipment for *any type* air conditioning job.
- **A nationally recognized name**—TRANE is well known for outstanding equipment . . . the famous TRANE CenTraVac, TRANE UniTrane units, TRANE Compressors and many more.
- **A truly national service organization**—fully trained and equipped, available to help you . . . not a "phantom" service force!
- **Complete business freedom!** TRANE Authorized Dealers have complete freedom of action in buying and selling. No problems of quotas or minimum orders when you deal with TRANE!
- **Nationwide sales force**—A network of Sales Offices in 90 cities working with architects and engineers to obtain favorable specifications and over-all company acceptance.

• PLUS selling aids like these:



National consumer advertising in SATURDAY EVENING POST, U. S. NEWS, FORTUNE, BUSINESS WEEK and other leading magazines—plus liberal co-operative advertising program (optional)—plus FREE newspaper advertising mats for local use.



Colorful sales literature, booklets, proposal covers, window decals and signs for your place of business—or for use at installation sites. You get everything you need to help you sell, install and service the finest air conditioning equipment when you go TRANE!

*For heating, cooling, ventilating...
for any air condition, turn to*

TRANE

MANUFACTURING ENGINEERS

The Trane Company, La Crosse, Wis. • Eastern Mfg. Div.,
Scranton, Pa. • Trane Company of Canada, Ltd., Toronto
90 U.S. and 19 Canadian Offices

Circle No. 15 on Reader Service Card

WANT MORE FACTS on your profit possibilities with the complete TRANE line? Just call your nearby TRANE Sales Office—or send the coupon to TRANE.

Please attach to your letterhead

The TRANE Company, La Crosse, Wisconsin

Please send me complete information on the new TRANE Self-Contained Air Conditioners—plus information on what a TRANE Authorized Dealership means to me.

Name _____

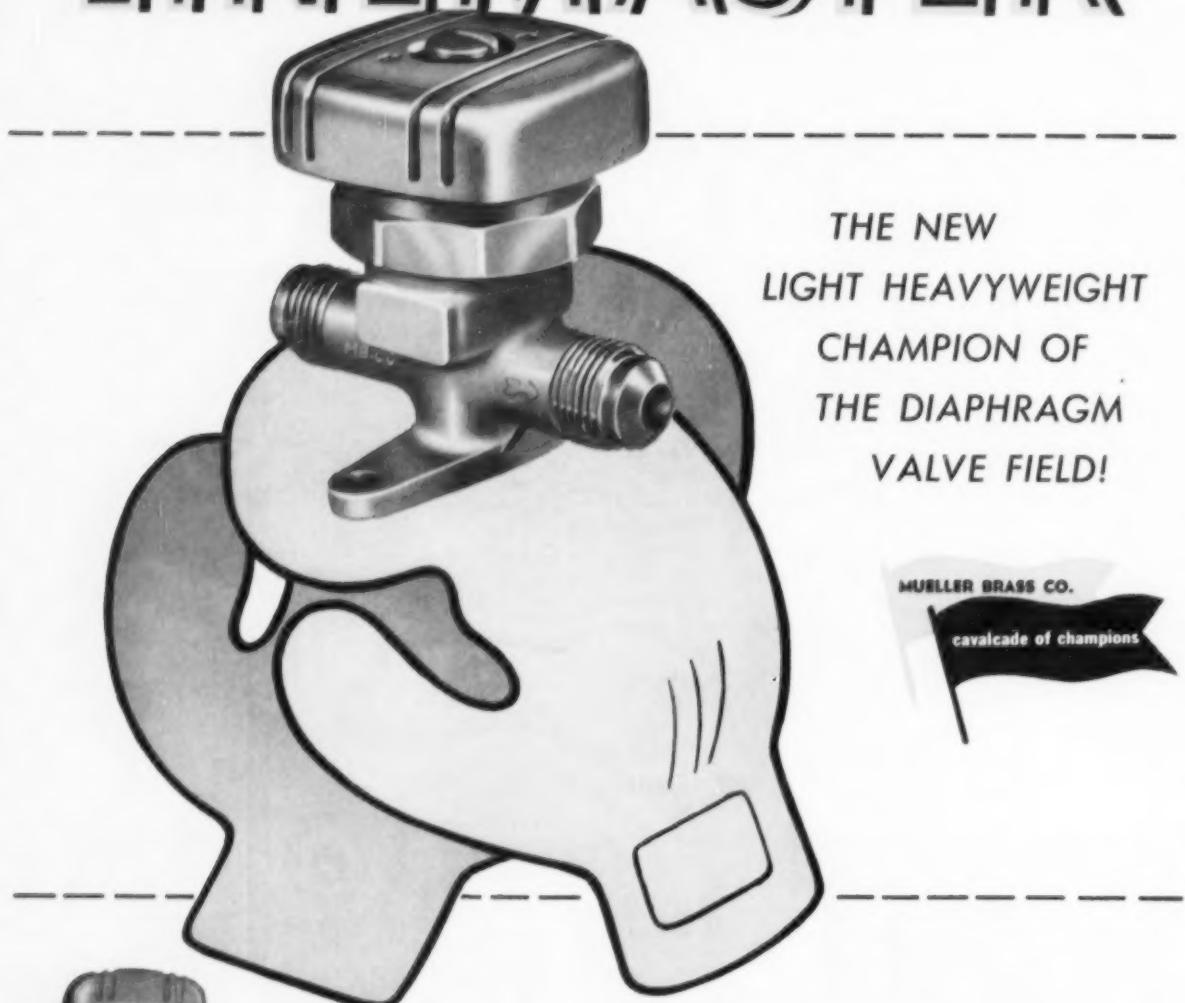
Company _____

Address _____

City _____ Zone _____ State _____

INTRODUCING THE MUELLER BRASS CO.

LINEMASTER



THE NEW
LIGHT HEAVYWEIGHT
CHAMPION OF
THE DIAPHRAGM
VALVE FIELD!

MUELLER BRASS CO.

cavalcade of champions



SUPER-SEALING

A phosphor bronze dia-phragm between two stain-less steel dia-phragms gives the LINEMASTER an unbeatable combination for super-sealing and long life. Dia-phragms pressure wear tested for thousands of openings and closings without failure.

SUPER-SEATING

In the LINEMASTER, tough, resilient molded nylon seat disc insures positive shutoff even if foreign material is lodged against the seat-ing surface. Mueller Brass Co. pio-neered and proved the superiority of nylon for "super-seating".

The simple design and sound engineering of this compact forged brass LINEMASTER make it a real heavyweight among "shorty" diaphragm valves. These new LINEMASTERS are solid brass construction throughout . . . even to the comfortable, square design handwheel. Flow passageway is streamlined to eliminate turbulence and provide full-flow. Exclusive triple dia-phragms of phosphor bronze and stain-less steel furnish seep proof sealing and excellent wear resistant properties. A tough, resilient nylon stem disc operating against a precision finished seat assures positive shutoff. Five straight-thru and angle type LINE-MASTERS with flare, solder, and M.P.T. end connections are available. Never before has such a compact valve embodied so many good sound engineering features and been built to such high standards of quality. The LINEMASTER is really a light, heavyweight champion. See the popularly priced LINEMASTERS at your wholesaler's . . . and judge for yourself.



Engineers: Jaros, Baum and Boiles
Mechanical Contractors: Alvord and Swift

Conditioned air is delivered to all offices and public rooms of the new, modern Statler Hotel in Hartford, Connecticut, through Kno-Draft Adjustable Air Diffusers. Both round and square units are used—and a few of the new slot-type Kno-Drafts (not shown).

Primary reason for selection of Kno-Draft was the greater comfort assured by *draftless* air movement, uniform temperature, and the easy and accurate control of both air volume and flow pattern.

And notice how neatly the Kno-Draft squares fit into acoustical ceilings and how—square or round—the handsome Kno-Draft units blend unobtrusively with the architectural scheme of things.

For complete specifications, engineering and installation information on Kno-Draft round, square and slot-type diffusers, simply write on your letterhead to Connor Engineering Corporation, Dept. C-116, Danbury, Conn.



CONNOR
ENGINEERING
CORPORATION

kno·draft®
adjustable air diffusers

Circle No. 17 on Reader Service Card

ABOUT PEOPLE

Burton O. Haun Jr. has been appointed to the newly created post of field sales manager for Spencer Thermostat Div., Metals & Controls Corp.

Previous to joining Spencer in 1947, Haun worked at Emerson Electric Mfg. Co. At Spencer, he has served as application engineer, field engineer in the Dayton territory, and assistant product manager for motor protectors and starting relays.



Duane G. Merrill has been appointed sales manager, field sales, for Acme Industries, Inc. Merrill, with Acme since 1947, formerly was eastern regional manager with headquarters in New York City.

Century Electric Co., has announced the appointment of **J. P. Hoffberger**

to the district managership of the company's Hartford, Conn. office. Hoffberger, in 1933, became sales manager of the General

Electric distributor organization in the St. Louis area. In 1938, he left GE to join Wagner Electric Corp. as a field sales manager. He was with Wagner until 1948. Immediately prior to joining Century, he was sales manager of the eastern district of the Electric Motor Div. of A. O. Smith Corp.



Appointment of **H. O. Kirkpatrick** as vice president in charge of refrigeration for Hunter Mfg. Co., of Solon, Ohio has been announced. Kirkpatrick founded Oldsmobile Co. in Detroit, in 1949 to manufacture

and market truck refrigeration and mobile air conditioning units. He was president of the firm until 1951 when it became a division of Union Asbestos and Rubber Co. Since that time he has served as chief engineer of Oldsmobile Div. from 1951 to 1953 and division manager from 1953 to June 1956.



William C. Kelly has been named purchasing agent of Reading Tube Corp. Kelly has been assistant office manager with Reading for the past two years.



Appointment of **F. C. DeLorenzo** as manager of advertising & sales promotion for General Electric's commercial and industrial air conditioning department has been announced.

Prior to his new position DeLorenzo was supervisor of advertising and sales promotion. From 1951 to 1953, he headed the publicity operation for the company's Air Conditioning Div. He joined GE in 1948 as editor of the employee newspaper in Bloomfield, N. J.

La Crosse Cooler Co. has appointed additional representation for its vending machine division. **John W. Montgomery** will cover the states of Virginia, Maryland, Delaware, New Jersey, and the District of Columbia. **Louis A.**

Stark will handle the states of New York and Pennsylvania. **Jack Sutton** will travel Missouri, Iowa, Nebraska, and Kansas.

Michael J. Koenig, manager of market planning and sales research of Redmond Co., Inc., has been promoted to general sales manager of the corporation. In addition to the sales office in

Owosso, Mich., Koenig will assume the direction of the Redmond regional sales offices in Los Angeles, New York, Dallas, Cincinnati, and Chicago. In 1948, Koenig came to Redmond as assistant to the sales manager and subsequently represented the company in the mid-western and southern states as a sales engineer. In 1955, he assumed the market planning and sales analysis position.

Roger K. Mattson has been appointed manager of mechanical contractor and industrial coil sales for McQuay, Inc. Mattson has 20 years experience in the heating and air conditioning industry, 10 of which have been with McQuay in sales engineering capacities. He will headquartered in Minneapolis.

Stephen F. Smatlak has been named field sales representative for Janitrol Div. of Surface Combustion Corp. in the Long Island, N. Y. area. Prior to joining Janitrol, Smatlak was gas heating & air con-

ditioning representative for Long Island Lighting Co., Mineola, N. Y. He has been coordinator of production Powerhouse and Ma-



rine Steam Generators for Combustion Engineering Superheater Corp., and sales representative for Bryant Mfg. Co., Inc.



O. L. Rose

Dole Refrigerating Co., announces several changes in its executive staff. **O. L. Rose**, vice president, secretary-treasurer, and assistant general manager, has gone into partial retirement after 18 years with the company.

Harold P. Hansen, general sales manager, and former Canadian branch manager, has been appointed assistant general manager. **George E. Frankel**, comptroller, has been elected sec-



H. P. Hansen



J. Hutchinson

retary-treasurer. **John E. Hutchinson**, research and development engineer, takes over as general sales manager. **Bruce P. Tweed**, western division sales manager, has been recalled to the home plant and will head the research and product development division.

Three personnel changes have been announced by Gibson Refrigerator Co., Div. of Hupp Corp. **A. F. Johnson** has been promoted to product manager. **Charles Sims** has been appointed regional sales manager for the Washington, D. C. area, and will headquarter there. **Frank Early** has been named regional sales manager for Gibson's air conditioning and heating division. Early's headquarters will be in Dallas, Tex.

Bill Ashby has been appointed director of service engineering for Cornell-Dubilier Electric Corp. Ashby, in his last five years of service engineering, has traveled over 250,000 miles and discussed service problems with some 50,000 servicemen in 600 meetings.

Borg-Warner Corp. has appointed **Roy C. Hauck**, manager of its Primor Products Div. Hauck, who will headquartered in Adrian, Mich.,

formerly was assistant manager of the corporation's Ingersoll Conditioned Air Div. in Kalamazoo, Mich.

Airtemp Div., Chrysler Corp., announces the appointment of **M. L. Franzel** as assistant regional manager and the addition of **R. S. (Bob) Martin** as district manager of the West Coast region. Franzel has been with Airtemp since 1954. Prior to his new ap-



FALSE AND TRUE!

A "divining rod" was a twig or a branch used to locate an underground spring or spot where water existed. The rod was supposed to tip or bend toward the ground when held over the invisible water location. This was eventually proved FALSE.

However, it is TRUE that Thawzone, the moving dehydrator, travelling to every part of the unit, "searches out" moisture and destroys it. This saves moisture-removal time and avoids costly call-backs.

THAWZONE ALSO HAS THESE ADVANTAGES:

1. Actually destroys moisture . . . not a mere anti-freeze.
2. Scavenges oxygen . . . helps to overcome the harmful effect of traces of oxygen which may remain in a refrigeration system after the usual purging.
3. Cannot cause pressure drop.
4. Does not release moisture when temperature changes.
5. May be used in open or hermetic units containing any of the "Freons", methyl chloride, methylene chloride or isobutane.
6. Costs only about 8 cents per lb. of refrigerant treated. Used in minute amounts.

Why don't you try a 1 oz. bottle of Thawzone?

Also available in 4 oz. and pint bottles.

Call your wholesaler.

THAWZONE®
The Only Product That DESTROYS Water
and Reaches All of It

Circle No. 18 on Reader Service Card

pointment he was district manager for its Denver sales district. Martin has held sales posts with Airtemp's San Francisco distributor and with Hafey Air Conditioning Co., San Pablo, Calif. He will headquartered in San Leandro, Calif.

•

Max H. Schachner has been named manager of Union Asbestos & Rubber Co.'s Coldmobile Div. Schachner, who will headquartered in the company's Blue Island, Ill.,

plant, was secretary-treasurer and general manager of Transicold Corp. of Los Angeles prior to joining Unarco.

•

J. R. Matullo has been appointed branch manager of Worthington Corp.'s New Jersey sales office. Matullo joined Worthington in 1934 as an application engineer in the Harrison Division rotary pump

sales department. In 1936, he was transferred to the corporation's New York district office, serving here until 1938 when he returned to Harrison to serve in the New Jersey sales office as a general line salesman until his present appointment.

•

C. A. "Pete" Comstock has been named district sales manager

for Florida and the southern half of Georgia for Typhoon Air Conditioning Co., Div. of Hupp Corp. Comstock will supervise the Typhoon dealer organization formerly managed by Harry Jobes, now general manager of Typhoon Heat Pump Co., of Tampa, Fla. Comstock was with Crane Co. from 1947 to 1952, organizing dealers both in engineering and sales.

•

Robert K. Miller has been appointed general manager of General Electric Home Heating and Cooling Dept., Tyler, Tex. Miller assumes his duties at the department's new headquarters in Tyler where

the company recently completed a 15 million dollar plant for the manufacture of home cooling units. Prior to his appointment, he

D

Now that the heat's off pick up *profitable* gasket business with...



JARROW
Curvall
SERIES 1400

FOR REFRIGERATOR AND FREEZER DOORS

Now's the time to go after those household and commercial gasket jobs you missed during the summer. Jarrow "Curvall" rubber gaskets are a snap to install as they (1) shape themselves to rounded corners, making notching unnecessary; (2) fit perfectly on the straight sections of the doors, as well.

(Service tip: by carrying all 11 "Curvall" gasket sizes with you at all times you don't have to waste valuable time going back to your wholesaler for the right gasket. You see, these 11 sizes fit practically every late model refrigerator and freezer door on the market).

Ask your wholesaler to show you the "Curvall" display board. You'll see how easily "Curvall" is applied.




Circle No. 19 on Reader Service Card

Jenni Genetron says:

Buy from your
genetron
wholesaler
displaying
this clock!



**IT'S ALWAYS THE RIGHT TIME
FOR genetron® Super-Dry Refrigerants**

genetron 11 ORANGE LABEL
TRICHLOROMONOFLUOROMETHANE

genetron 12 WHITE LABEL
DICHLORODIFLUOROMETHANE

genetron 141 GREEN LABEL
MONOCHLORODIFLUOROMETHANE

genetron 226 PURPLE LABEL
TRICHLOROTRIFLUOROETHANE

genetron 320 DARK BLUE LABEL
DICHLOROTETRAFLUOROETHANE

Wherever you are—from coast to coast—there's a "genetron" wholesaler as close to you as your telephone. When you order refrigerants, always ask for "genetron" super-dry refrigerants!

Basic Chemicals for American Industry

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

Circle No. 20 on Reader Service Card

& AIR CONDITIONING • NOVEMBER, 1956



was manager of manufacturing for the Vacuum Cleaner Dept., Cleveland, Ohio. He joined General Electric in 1947.

Robert Sheridan has been appointed to a newly created post,



manager of products and sales development in the commercial and residential air conditioning division of Mitchell Mfg. Company. Sheridan formerly was with the air conditioning sales division of Westinghouse, and prior to joining Mitchell was manager of national accounts for York Corp.

Luther Wiesner, New York State representative for Howard Refrigerator Co., Inc., since 1950, died recently after a short illness.

E. W. Ervasti has been appointed general sales manager of Calumet &



Hecla of Canada Ltd. Ervasti previously was secretary to the sales manager, manager of a product line, and sales representative in

both the Detroit and St. Louis areas, in his 18 years with Wolverine Tube, Div. of Calumet & Hecla, Inc. He has been industrial sales manager for Wolverine since 1953.

Gurth Baldwin has been named manager of the Iron Fireman sales and service branch in St. Louis. **Richard H. Byers** was named manager of the Cleveland sales and service branch, succeeding Baldwin.

James H. Harris Jr. has been appointed vice president in charge of sales for Clark Door Co. Harris, who joined the company in 1953, will be responsible for the development of sales and distribution of the firm's line of automatic cold storage doors.

Frank C. Hawk has been named general manager of Bohn



Aluminum & Brass Corp.'s new Betz Div. in Danville, Ill. Bohn recently purchased Betz Corp. of Hammond, Ind., manufacturer of products for

the air conditioning and refrigeration industries, and moved it to a newer and larger plant in Danville, Ill. He has had 20 years of experience in various engineering and sales management positions.

Koch Refrigerators, Inc., has announced the appointment of **Harold V. "Smitty" Smith** as the new district representative in its mid-south territory. During the past 7 years Smith was district sales manager for Sanitary Scale Co. in approximately the same territory.

John F. Zubrod has been appointed product manager of the air conditioning division of Whirlpool-Seeger Corp. Zubrod was associated for 23 years with the commercial refrigeration division of Servel, Inc.,



which he joined in 1933 as an engineer. He was promoted to the successive positions of applications department manager, assistant to the vice president in charge of the division, and product manager.

William P. Sterling has been appointed assistant to J. A. Etter, manager of the Cincinnati branch office of Frick Co. Sterling first worked with Sterling Engineering and Machinery Co., Schiller Park, Ill. Following this he was with National Refrigerators Co., St. Louis, and in the St. Louis office of Baker Refrigeration Corp.

William D. Graham Jr., manager of Trane Co.'s sales office in Greensboro, N. C., for the past four years, has been promoted and transferred to the firm's home offices in La Crosse, Wisc. Graham will specialize in sales office operation and procedure as part of the general sales staff and seek to augment liaison between field and home offices. Taking over as manager of the Greensboro office is **E. A. Stroupe Jr.** who has been with the North Carolina staff since 1950.

Mansur Storrs has been named sales representative for the territory of Maine, Vermont, New Hampshire, Rhode Island, Massachusetts, and Connecticut for Jas. P. Marsh Corp. Storrs will operate from the corporation's recently opened New England sales office in Quincy, Mass.

William J. Meek has been appointed a factory representative for Howard Refrigerator Co., Inc. in the North and South Carolina areas. Meek will train and set up new dealers and distributors, as well as contact present Howard distributors and dealers.

A low priced, dependable control for liquid, air and surface temperature

the New Honeywell Refrigeration thermostat

WITH THE NEW L6021 refrigeration thermostat, Honeywell offers you a complete line of refrigeration temperature controls. The remote bulb thermostat gives you low-cost, dependable control of air, liquid and surface temperature. And its built-in versatility means you can satisfy a wide range of uses—and simplify inventories.

For information on the L6021 or on any of our complete line of heating-cooling controls, call your local Honeywell office. Or write Honeywell, Dept. CR-11-272, Minneapolis 8, Minnesota.

These features make the New Refrigeration thermostat the leading choice for all types of cooling applications

Faster response—No "lag" in response; no swings in cycling pattern • **"Repeatability"**—Holds temperature setting you choose • **Enclosed Micro Switch**—For trouble-free action • **Close control**—Holds temperature within a 2°F range • **Smaller remote bulb** • **Easy installation** • **Available with or without case**.



MINNEAPOLIS **Honeywell**

112 offices
across nation



First in Controls



For frozen food cases, the L6021 is safe, sure, dependable and economical.



For beverage dispensers, it holds temperature constant for better taste.



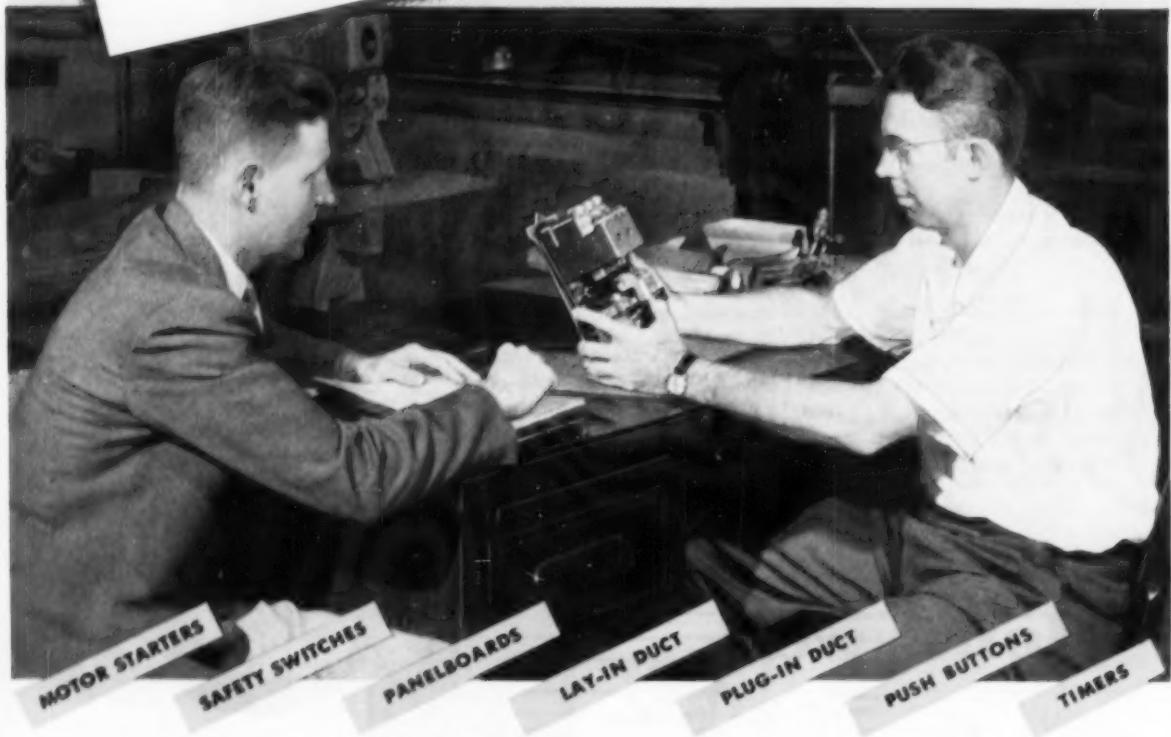
For ice makers, the L6021 gives closer control for more efficient operation.



For meat and vegetable cases, the L6021 has close control to avoid spoilage.



SQUARE D GIVES YOU ALL 3!

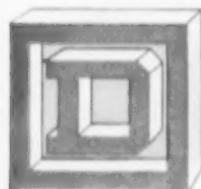


In the 60 Square D branch offices throughout the country there are Field Engineers ready to work with you on any electrical distribution or control problem. A substantial amount of their time is spent with original equipment manufacturers,

air-conditioning contractors, architects and mechanical engineers—finding the one best way to handle any given job.

It costs you nothing to have your nearby Square D Field Engineer work with you. Why not get acquainted with him?

NOW...EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE!



SQUARE D COMPANY

Circle No. 23 on Reader Service Card

NOVEMBER, 1956 • COMMERCIAL REFRIGERATION



Sporlan announces a complete line of replaceable core *Catch-Alls* with these 5 great advantages

1

The performance record of the famous Sporlan molded porous Catch-All Core, that keeps air conditioning systems perfectly clean, perfectly dry and acid free, is known by engineers everywhere.

2

The cores are individually activated to a high degree and packed in sealed cans to insure Peak Performance when installed.

3

Through superior engineering and design, the Sporlan replaceable core Catch-All achieves large flow capacity with low pressure drop.

4

As a result Sporlan replaceable core Catch-Alls are installed in the main liquid line instead of a by-pass, affording maximum drying and filtration at all times.

5

Main line installation means simplified piping and greater over-all economy.

for
air conditioning from
5 to 100 tons F-12

Now there's a Sporlan replaceable core Catch-All available to give you Peak Performance on any size air conditioning application. Ask your Wholesaler about them today.

Remember . . . Peak Performance on all installations is yours when you buy Sporlan Right Down The Line.



Non-replaceable core Catch-Alls for refrigeration and smaller air conditioning installations are also available.

SPORLAN
VALVE
COMPANY

7525 SUSSEX AVENUE
ST. LOUIS 17, MO.

EXPORT DEPT. AD. AURIEMA INC.
89 BROAD ST., NEW YORK 4, N. Y.

Circle No. 24 on Reader Service Card

& AIR CONDITIONING • NOVEMBER, 1956

25

See your



AMERICAN-Standard distributor!

AIR CONDITIONING DIVISION



Circle No. 25 on Reader Service Card

NOVEMBER, 1956 • COMMERCIAL REFRIGERATION

..... He's the man with the complete

DEALER PROFIT PROGRAM

No half-way measures . . . no half-way profits when you join up with your distributor of American-Standard Air Conditioning Division products. You'll find that he's a *specialist* in warm air heating, summer cooling and year 'round air conditioning . . . with a complete, top quality product line plus full technical and pro-

motional service. He has *everything* you need to build your reputation as a specialist . . . to sell constructively . . . to sell in volume. Contact him for the Complete Dealer Plan—he's listed in your classified telephone directory under "Furnaces" and "Air Conditioning Equipment". Or, if more convenient, just mail the coupon.

Complete product lines

HEATING. Gas-fired and oil-fired winter air conditioners in basement, utility, counterflow and horizontal models . . . all sizes. Also coal-fired winter air conditioners and gravity furnaces, oil burners and gas burners.

COOLING AND YEAR 'ROUND. American-Standard is now the largest residential line on the market! Full range of water-cooled add-on and package models; 2, 3 and 5 hp air-cooled outdoor condensing units plus vertical, counterflow and horizontal air-flow and blower-equipped evaporators. Large selection of heating-cooling combination units equipped for gas or oil firing with water-cooled or air-cooled summer air conditioning.

Complete technical assistance

TRAINING CENTER at American-Standard Air Conditioning Division factory, Elyria, Ohio, provides intensive courses, both elementary and advanced, covering all phases of heating and cooling layout, installation and servicing.

"HOW-TO" MANUALS. Complete, concise technical data are provided in easy-reference form; also, detailed installation and application manuals on each and every model.

FIELD SPECIALISTS. You work closely with your distributor's technical specialists who, in turn, are backed by American-Standard field and factory engineers. This means that you can approach even the most difficult equipment applications with confidence and authority.

Complete promotion

DEALER IDENTIFICATION. "Authorized Dealer" Certificate, indoor and outdoor illuminated signs, window banners and many other impressive identification items are included.

NEWSPAPER AD MATS. Wide variety of heating, cooling and year 'round pre-tested ads and product cuts.

SALES LITERATURE. Dozens and dozens of colorful pieces to help you promote and sell effectively.

RADIO AND TV. One-minute spot announcements and recorded singing commercials for radio; one minute filmed commercials for TV.

COOPERATIVE AD PLAN—the industry's most liberal cost-sharing promotional program.

AMERICAN-Standard

AIR CONDITIONING DIVISION



American-Standard Air Conditioning Division (Dep't C-11)
40 West 40th Street, New York 17, N. Y.
Please have your nearest distributor present The Complete Dealer Plan.

NAME _____
COMPANY _____
STREET _____
CITY _____ ZONE _____ STATE _____

Circle No. 25 on Reader Service Card

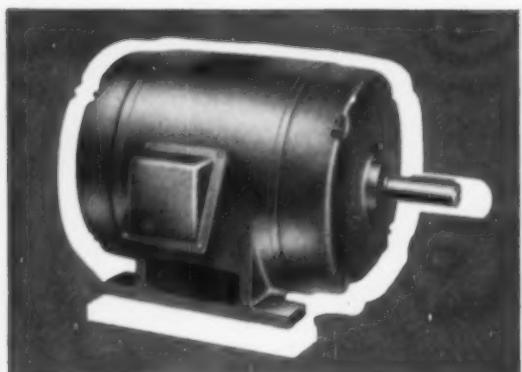


You get better
performance with these
Wagner DP Motors

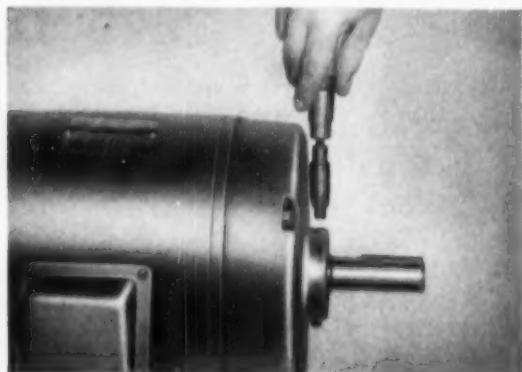
Wagner DP motors are doubly protected by (1) rugged, corrosion-resistant cast iron frames, smoothly rounded so that no moisture can collect on them. Motor feet are cast as an integral part of the frame for maximum strength and rigidity. (2) Enclosures on the DP motor are completely drip-proof—virtually splashproof. Air intakes are located at the bottom of the endplates and air outlets are located at the base of the frame—one on each side.

Although engineered to meet the re-rated NEMA specifications which call for more power in smaller frames, the same high quality and long life performance that have made Wagner Motors "the choice of leaders in industry" for many years has of course been retained.

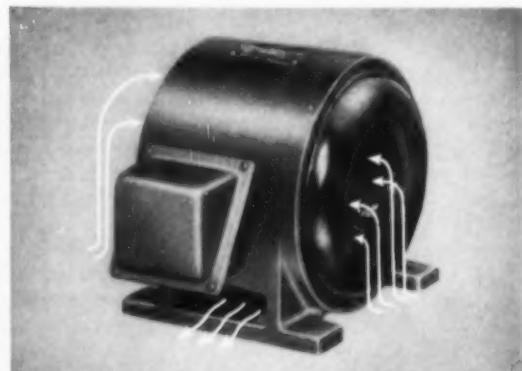
Full information and principal dimensions are given in Bulletin MU-202. Write for your copy today.



MORE POWER IN SMALLER FRAMES The Wagner DP Motor packs more power in a smaller frame and this smaller size means ease of handling and stocking...less space required for installation.



CAN BE RE-GREASED FOR LONGER LIFE This motor will operate for years without regreasing...bearings are completely enclosed...however, provisions have been made for adding lubricant and for the removal of old grease in cases where re-greasing is necessary.

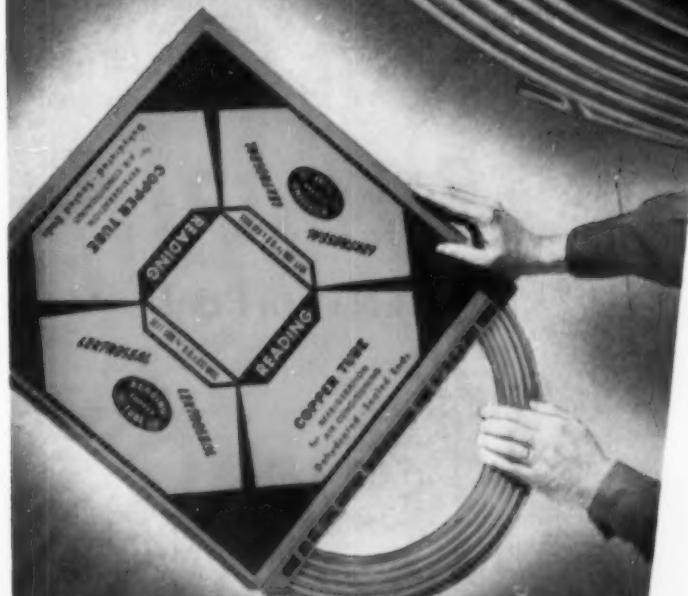


COOL RUNNING Specially designed baffles direct cooling air from the blowers through the motor and provide protection for the stator windings. Blowers are an integral part of rotor...and move large volumes of air without noise or vibration.

Wagner Electric Corporation
6442 Plymouth Ave., St. Louis 14, Mo., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

READING "LEKTROSEAL" COPPER REFRIGERATION TUBE



FIRST STEP
*in a Quality
Installation—*

Soft temper for easier forming . . .
dehydrated — with crimped ends
to seal out all moisture and dirt . . .
and keep the inside surface absolutely clean. Comes in handy 50-foot
coil packed in its own convenient protective carton, clearly
labeled for easy identification. To
be sure of the job — be sure to
specify Reading.



Sold Through
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OAKLAND, CALIF.

410 Hegenberger Road
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LOS ANGELES, CALIF.
120 No. Santa Fe Ave.

DENVER, COLOR.
2845 Walnut St.

CLEVELAND, OHIO

4615 Perkins Ave.

ATLANTA, GA.
690 Murphy Ave.
S.W., Unit 5, Bldg. B

Circle No. 27 on Reader Service Card



ANNOUNCING a whole new family of "VIRGINIA" WATER TREATMENT CHEMICALS!

"Virginia" announces the introduction of an entire new family of superior water treatment chemicals specifically designed for use in the air-conditioning, refrigeration and heating industries. These products were developed under field test methods which established their efficiency for practical use.

WATER TREATMENT and SCALE INHIBITOR
 "Virginia" Water Treatment & Scale Inhibitor is a special blend of sparingly soluble glassy polyphosphates which hold scale-forming solids in suspension or solution, greatly reducing scale buildup on metal surfaces. The slow, controlled solubility of the crystals supplies a continuous, effective inhibiting dosage—no feeder devices are required.

SCALE REMOVERS (Solid and Liquid)

When scale has already accumulated, "Virginia" Scale Removers are safe, quick and economical to use. Avail-

able in dry granular form for maximum safety to equipment, and for use in localities where water hardness is less than 200 parts per million; also in liquid form for heavier incrustations and where water hardness is greater than 200 parts per million.

NEW ALGAE-CIDES

"Virginia" Algae-Cide No. 1 is an organic copper compound which releases an exceptionally high copper ion concentration. It is more effective and more economical than ordinary copper salts. "Virginia" Algae-Cide No. 2 is a blend of two different water-soluble organic compounds for use in eliminating slime and mixed infestations of slime and algae. It is also recommended for killing copper resistant algae.

ICE MACHINE CLEANER

"Virginia" Ice Machine Cleaner rapidly and effectively removes scale

Circle No. 28 on Reader Service Card

NOVEMBER, 1956 • COMMERCIAL REFRIGERATION

and slime from ice machines. It eliminates the cause of objectionable odors and prevents formation of cloudy ice. It is easy, safe and economical to use.

Write for free literature
about all of these products

Refrigeration Division
239 Jefferson St.
VIRGINIA SMELTING COMPANY
West Norfolk, Va.



ESOTOO • KINETIC CHEMICAL'S FREON® REFRIGERANTS • V-METH-L
CAN-O-GAS • PERMAGUM • PRESTITE TAPE • KWIKWRAP • SUNISO
REFRIGERATOR OILS • WATER TREATMENT CHEMICALS

Available in Canada and many other countries

OVER 5 MILLION

Curtis prospects...
Your prospects

saw this full-color sales message

in
The Saturday Evening
POST

In a new, aggressive and continuing national advertising campaign to increase sales of Curtis equipment, this full-color sales message in the Post was driven home to more than 5 million prospective buyers of Curtis packaged air conditioning units.

If you are not a Curtis Dealer, and if you're qualified, now is the time to get started! You'll be selling the world's finest air conditioning equipment, competitively priced, and backed by a promotional-minded, on-the-go manufacturer with a solid 102 years of experience and skill.

Write today, and we'll show you how you can increase sales and profits with a complete, flexible line of Curtis Air Conditioning equipment.



Available
in 6 exciting refreshing colors

WHITE COLDWELL BRINCH TIDE POTTERY GRASS
BLACK BLUE GRAY SHAG BLUE WOOD

yes...

this beautiful Curtis Air Conditioning Unit
deserves to be seen!

...and where water
is a problem...

here's the answer!

No question about it. The new CURTIS packaged air conditioner is refreshing. It is also silent, dependable, efficient and economical to install and operate. It refreshes by circulating streams of clean, crisp, dry, cool air. CURTIS packaged air conditioners are available in a wide variety of sizes.

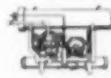


Remember
you can count on
our 102nd year

Curtis



Packaged air cooled
air conditioning units



Packaged liquid
chiller up to 100 tons



Industrial air
compressors



Auto Lifts
single & two post

MANUFACTURING CO.

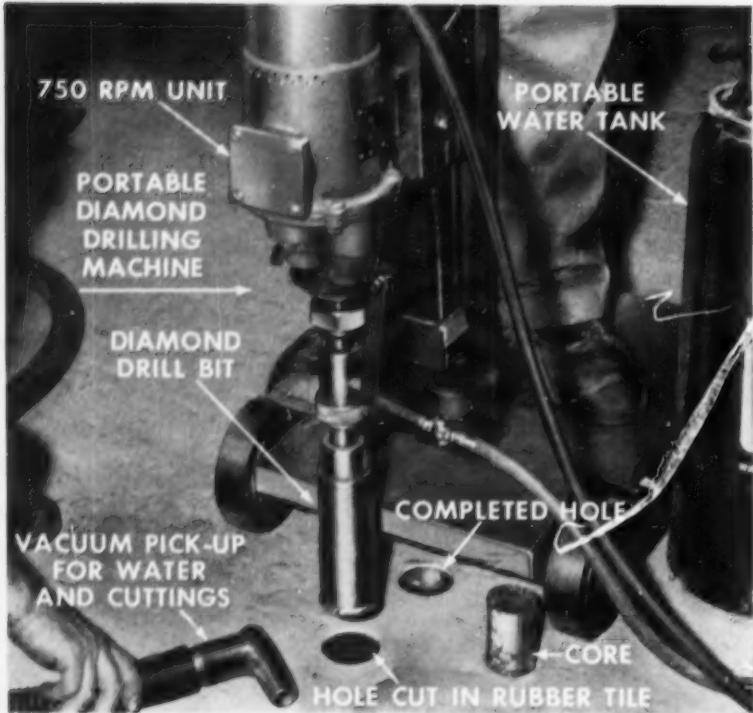
Refrigeration Division

1915 Kienlen Ave., St. Louis 20, Mo.

CM-15

Circle No. 29 on Reader Service Card

& AIR CONDITIONING • NOVEMBER, 1956



TRUCO Drills 2½" Holes in 90 Seconds on 8,400 Outlet Electrical Project

JOB: Penetrate 3½" concrete cap over cellular steel flooring for 2½" dia. electrical outlets at Ford Motor Company's new Administration Building. 8,400 holes required to bring in electrical, telephone and inter-com wiring for offices.

CONTRACTOR: Harlan Electric Company, Detroit

TOOLS: Truco Diamond Drilling Machine equipped with 750 RPM Motor and 2½" O. D. Truco Diamond Drill Bits. (Machine was also used for horizontal drilling.)

DESCRIPTION: Spotting crews located outlets and cut the rubber floor tile with a circular saw. Portable rubber-tired Truco Diamond Drilling Machine then drilled through concrete in 90 seconds per hole. Complete cores were lifted out leaving smooth, perfect holes, requiring no patching or finishing. Finished floor undamaged by drilling operation.

Picture shows Truco vacuum water pick-up removing cuttings and coolant water as Truco unit is drilling. Because Truco is dust-free and relatively quiet, drilling was done in occupied sections of the building without disturbing tenants.

Job superintendent reports, "No other equipment could do the job the diamond drill performed on this project. It shaved weeks off our schedule and reduced our drilling costs materially."

WRITE FOR NAME OF NEAREST DISTRIBUTOR

WHEEL TRUEING TOOL CO.
97-3200 W. Davison Ave. • Detroit 38, Michigan

Circle No. 30 on Reader Service Card

32



Who Makes "Temtron" Unit?

EDITOR:

Who manufacturers the 2-ton water cooled "Temtron" unit? Could not locate in your 1955/1956 Catalog. Would appreciate literature, prices and discounts.

JOHN H. DART
Penna. Air Conditioning Co.
Philadelphia, Pa.

"Temtron" is a trademark of Ultrasonic Corp., 640 Memorial Drive, Cambridge 39, Mass. We are not certain whether this company is still in the air conditioning field, and we suggest that you get in touch with them for any additional information.

* * *

Desires Marketing Handbook

EDITOR:

I have been looking at a 1949-50 edition of your Marketing Handbook. I would like to know the availability of the current edition of this book.

FORREST BRICKER
S. A. Long Co., Inc.
Wichita, Kansas

The 1949-50 edition of the Handbook was the only one which we have issued. However, we do now issue a CATALOG OF CATALOGS, the most recent one being our 1955-56 edition. This book is priced at \$5.00, and contains a directory of manufacturers plus technical charts and data applying to both air conditioning and refrigeration. However, it does not contain any marketing data of the type that was in the original Marketing Handbook.

* * *

Says Wiring Article Offered Vital Sales Information

EDITOR:

In your June '56 issue you carried an article entitled, "Proper Planning of Electrical Wiring for

Circle No. 31 on Reader Service Card →



here's the new

Mark of Distinction

symbolizing White-Rodgers famous standard of quality in controls for modern comfort



Raymond Loewy,
internationally famous
industrial designer

styled by RAYMOND LOEWY ASSOCIATES . . .

world's largest firm of industrial designers . . . whose internationally famous creative talents have developed new prestige and sales for some of America's most distinguished products.

Look for this trademark . . . you'll be seeing it everywhere . . . on White-Rodgers heating, refrigeration and air conditioning controls . . . on cartons, boxes, labels, catalogs and new products.



One of the first products to display the new Mark of Distinction is the NEW *Fashion* Thermostat—most exciting design idea in thermostats . . . in years.

AUTOMATIC CONTROLS for heating, air conditioning and refrigeration

WHITE-RODGERS

ST. LOUIS 6, MISSOURI

TORONTO 8, CANADA



New McIntire DC FILTER-DRIERS with PERMASORB



give 3 TIMES More Protection

Now—buy the same size DC Filter-Drier as before, pay the same price—but get *triple* drying and filtering protection.

300% more drying capacity—3 times greater protection against moisture, acids and system failures because it is charged with the sensational new PERMASORB desiccant.

PERMASORB is a blend of drying agents designed to give maximum balanced drying at high, low and minute concentrations of moisture over the entire range of liquid line temperatures.

ADVANTAGES

- 3 times more drying capacity.
- Need not be installed in cool location—holds moisture under all refrigeration conditions.
- Ideal for extra-low temperature jobs.
- Neutralizes acids quickly.
- Best for all refrigerants—a must for refrigerant 22.
- Will not break down under extremes of moisture or acid.
- Dries super-fast, gets systems operating promptly.

THE McINTIRE COMPANY, Livingston 11, New Jersey

DRIERS • FILTERS • STRAINERS



Since 1925

Install them for faster drying, longer protection, fewer callbacks, bigger savings.

ASK YOUR
WHOLESALER FOR
DC FILTER-DRIERS
WITH PERMASORB

Circle No. 32 on Reader Service Card

NOVEMBER, 1956 • COMMERCIAL REFRIGERATION

Room Air Conditioner Installations", by Edward Dowis.

This article, including sketches, is the simplest yet most complete summation of basic facts regarding electrical wiring that I have seen for some time. It contains the exact information that most of us responsible for air conditioning sales must make sure is in the hands of everyone connected with the closing of a sale, particularly the dealer and his retail sales people.

Please send us 100 reprints of this article as soon as they are available.

WILLIAM H. PETERS
General Sales Manager
Brown Products Corp.
Forest Hills, N.Y.

Unfortunately, no reprints of this article were prepared. Permission to reprint it, however, will be gladly granted upon request, providing proper credit is given COMMERCIAL REFRIGERATION & AIR CONDITIONING.

* * *

Photograph Is Requested

EDITOR:

I was very much interested in receiving your July issue and noting the article appearing on page 48 entitled "Make Room for More Cooling". The photograph which appeared with this article showing a walk-in cooler in combination with retail doors interests me, and I am wondering whether or not I might be able to secure a print of this photograph for our files.

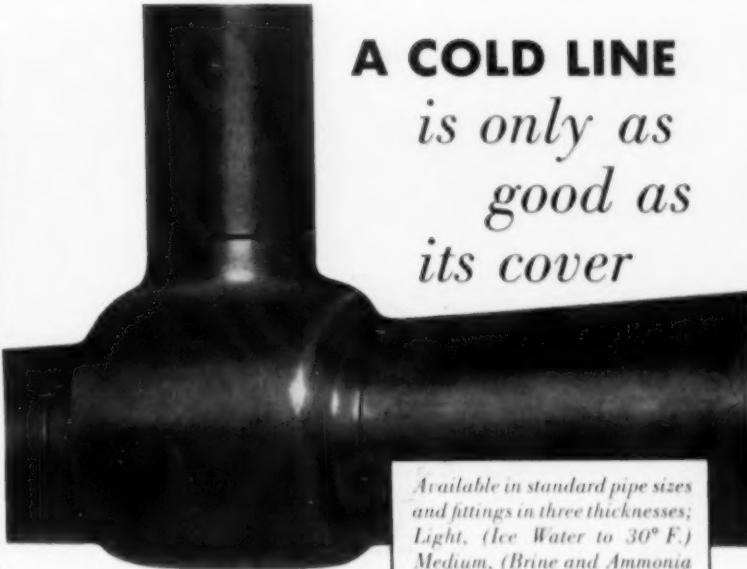
A. K. THORNEY, JR.
Sales Promotion Manager
C. V. Hill & Co., Inc.
Trenton, N.J.

Photograph gladly sent with our compliments.

FEDDERS-QUIGAN ADDS 6 HEATING REPS.

Fedders-Quigan Corp., has announced the following additions to its list of heating representatives: Wm. Berrington & Sons, Inc., Cleveland, Ohio; Radi-Heat of Kansas, Kansas City, Mo.; Southern Plumbing & Heating Sales Co., Memphis, Tenn.;

E. W. Reinertsen, Minneapolis, Minn.; W. H. Dudley, Jr., New Orleans, La.; and Bryant-Williams Co., Pittsburgh, Pa.



A COLD LINE
*is only as
good as
its cover*

*Available in standard pipe sizes
and fittings in three thicknesses;
Light, (Ice Water to 30° F.)
Medium, (Brine and Ammonia
to 0° F.)
Heavy, (Heavy Brine—25° F.
and lower.)*

UNITED CORK PIPE COVERING THE IDEAL COLD LINE INSULATOR

A cold line system is only as effective as its insulation. Inferior pipe covering in just one section of the line will cause operating costs to skyrocket and a considerable loss in dollars to the cold storage operator. United's pipe covering gives you the best insulation with all these advantages:

- Extremely low "K" factor
- Retains over 80% of cold loss on piping
- Easy and economical to install
- Long trouble-free life
- Fire retardant—Vermin resistant
- No capillarity

LARGER STOCKS—FASTER DELIVERY—PERSONAL SERVICE

United Pipe Coverings are available from stock for prompt delivery—to fulfill your immediate installation requirements. Mail the coupon below for additional information or the name of the United distributor nearest you.



UNITED CORK COMPANIES

7 Central Ave., Kearny, New Jersey



*Manufacturers of cork
insulation for almost
a half century*

UNITED CORK COMPANIES, 7 Central Ave., Kearny, N.J.

Please send United Cork Catalog. I am interested in

NAME _____

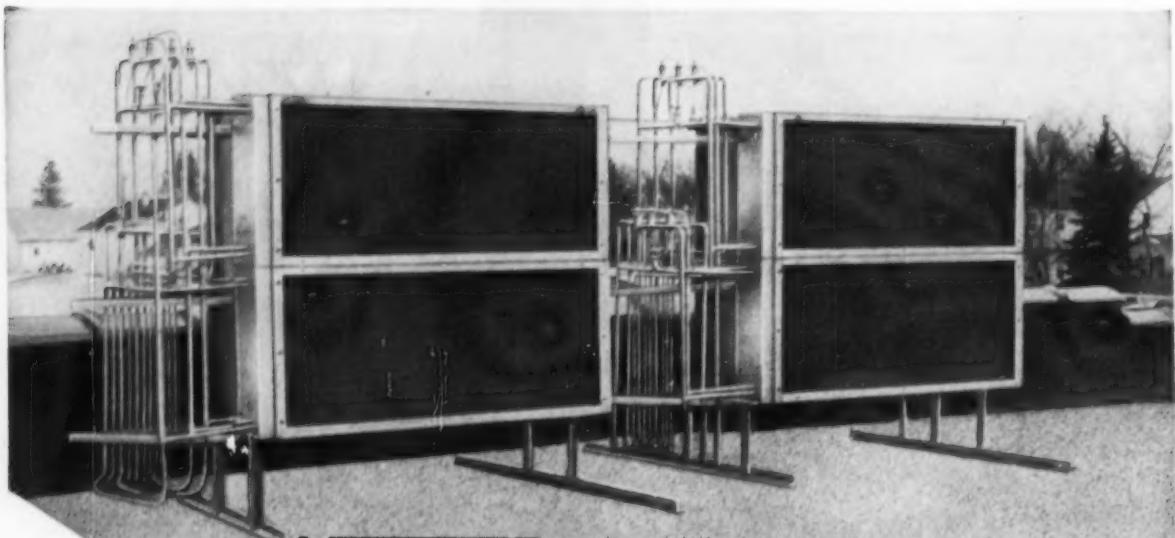
FIRM _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Engineering offices, or approved distributors, in key cities—coast to coast.

Circle No. 33 on Reader Service Card



KRAMER

UNICON FOR SUPERMARKETS

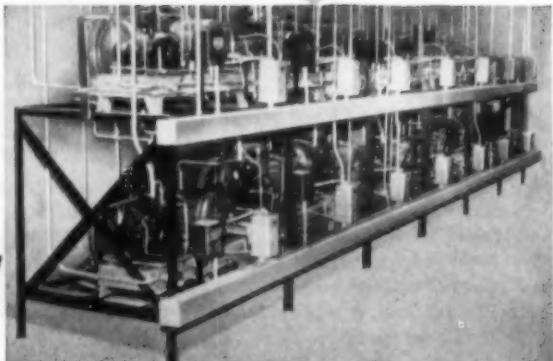
Serves 14 Compressors
Winter and Summer
WITHOUT ANY WATER*

Photographs of
UNICON installation
at Trimborn's Supermarket,
Hales Corner, Wisconsin

Installed by
Real Refrigeration
Sales and Service,
Milwaukee, Wisconsin
Units furnished by
Wisconsin Refrigeration
Supply Company,
Milwaukee, Wisconsin

WRITE FOR BULLETIN U-291

*UNICON is a Remote-Type Air-Cooled Condenser



KRAMER TRENTON CO. • Trenton 5, N.J.

Circle No. 35 on Reader Service Card

NOVEMBER, 1956 • COMMERCIAL REFRIGERATION



Remarkably flexible, Armaflex is simple and neat to apply to air-conditioning systems such as this one at the Connecticut General Life Insurance Company's new office building in suburban Hartford, Conn. Armaflex's cellular structure seals out moisture and air, prevents condensation.

New insulation for fluid cooling and heating lines is flexible for fast, easy application

The great flexibility of Armstrong Armaflex® permits fast, easy insulation of both commercial and residential air-conditioning and heating lines. Made of a resilient, foamed plastic, Armaflex slips right over pipes and copper tubing, follows contours without special cutting or fitting. If lines are already in operation, just slit Armaflex lengthwise, snap in place, and seal with Armstrong 520 Adhesive. No separate vapor barrier is needed.

Fitting covers can be quickly fabricated from miter-cut pieces and cemented together. Armaflex is clean to work with, too. It will not chip,

crumble, or rub off; waste is negligible. A self-extinguishing feature makes Armaflex completely safe to install before sweat fittings are made.

Highly efficient, Armaflex in $\frac{1}{2}$ " wall thickness prevents condensation under normal design conditions on indoor lines operating as low as 32° F. Its low k-factor of 0.28 at 75° F. stays low for the life of the installation. Armaflex comes in 6' lengths, for pipes and tubing up to 3 $\frac{1}{8}$ " i.d.

For free booklet containing complete data on this remarkable new insulation, write to Armstrong Cork Co., 2011 Rumford Avenue, Lancaster, Pa.



Slipped right over lines before they're put into operation, Armstrong Armaflex follows contours readily without time-consuming special cutting or fitting.



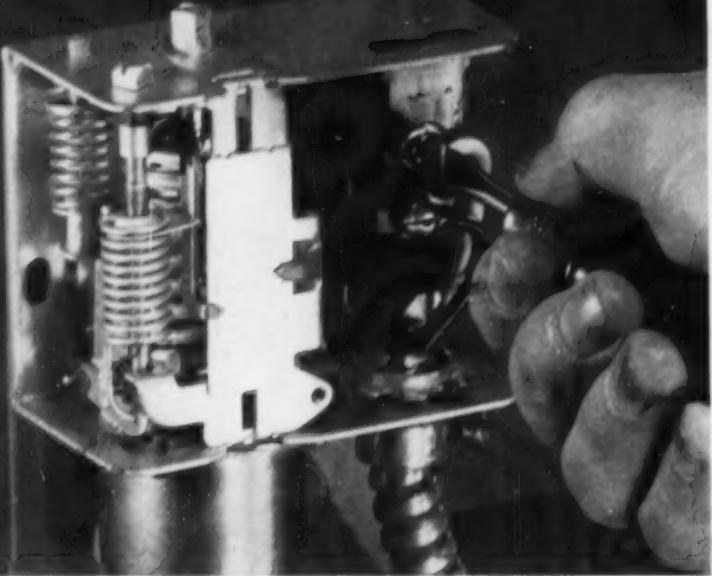
Joints are cemented with Armstrong 520 Adhesive. When they are required, fitting covers can be easily fabricated from miter-cut pieces of Armaflex.



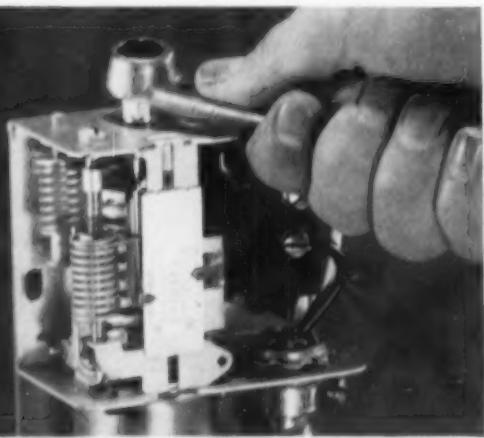
Pre-insulated with Armaflex, these heating-cooling lines are ready to be connected to the air-conditioning units. No further insulation is needed.

Armstrong
INDUSTRIAL INSULATIONS

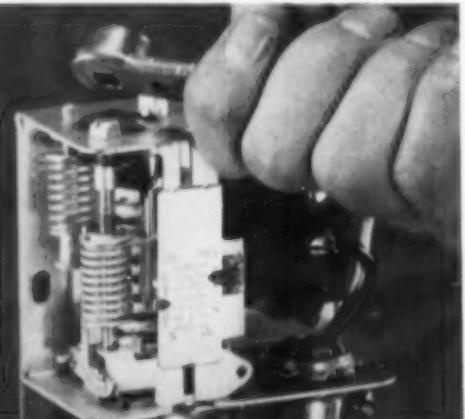
Circle No. 34 on Reader Service Card



Easy to install: Mount control on compressor unit or any flat surface (bracket furnished) and connect flare nut on capillary. Then, make 2 simple electrical connections; terminals are easily accessible.



Cut-in setting: To raise or lower cut-in setting, turn cut-in screw as required . . . differential does not change.



Cut-out setting: Turn cut-out screw to raise or lower cut-out setting independently of cut-in setting. This widens or narrows differential.



Series 270: Available in single or double pole construction with or without external adjusting knob.

PENN REFRIGERATION CONTROL IS EASIER TO INSTALL AND ADJUST

**Single Pole Series 270 Combines
Simple Design With Snap-Acting Contact
Action For Long-Life Dependability**

Designed with *you* in mind, the Series 270 takes all the hard work out of installation. And, adjustment is even simpler because of Penn's direct-reading, calibrated scale indicating cut-in and cut-out settings. Time-wasting subtraction or addition is eliminated.

Once installed, the Series 270 will perform longer, better, more accurately! One reason is the exclusive contact structure which provides "roll-wipe-snap" action on closing and opening. There's no bounce . . . no closing arc . . . no welding of contacts.

Try the Penn Series 270 on your next job and you'll see the great difference. Ask your wholesaler for the "270." **Penn Controls, Inc., Goshen, Indiana.**

PENN AUTOMATIC CONTROLS

For Heating, Refrigeration, Air Conditioning, Gas Appliances,
Pumps, Air Compressors, Engines.

BINU'S

TRENDS • OPINIONS • REPORTS

FROZEN FOOD RESEARCH continues to seek methods of freezing new foods and to improve freezing techniques on products now being frozen commercially. Recent projects at United States Testing Co. include: development of freezing methods for bakery products; effectiveness of germicides at low temperatures; and microbiology of frozen dessert toppings, vegetables, fruits, and frozen orange and lemon concentrates. Special studies are trying to determine, among other things, the cause of damage to frozen hams.

VACUUM-COOLING as a means of preserving agricultural produce has progressed to the point where vacuum chambers large enough to accommodate a loaded refrigerator car or truck have been constructed, according to a U. S. Dept. of Agriculture report. Vacuum-cooling, first used commercially in 1948, is a process in which air is pumped out of a vacuum chamber in which produce has been placed. Evaporation of water from the produce cools it. Vacuum-cooling is a rapid operation, but initial investment for this type of equipment is high and operation over a long period of time would be necessary to justify the cost.

THE HOUSEWIFE'S DUST RAG soon may be a thing of the past. A preview of "Things to Come" in family living recently was presented at a conference of companies cooperating in Monsanto Chemical Co.'s "House of Tomorrow" project. A zone-controlled, year-round air conditioning system that wafts harmonic scents and eliminates the dust rag was one of the near-future developments reported. The "House of Tomorrow" will be built in Disneyland early next year, and is based on molded modules, 8 x 16', which are curved to form ceiling, wall, and floor.

FROZEN PIES SELL at a rate of 300 a week, three times as fast as fresh baked pies from the same baked goods department of a Waltham, Mass., supermarket, according to Edward Phillips, frozen foods manager. Originally an experiment to keep the baked goods department from out-of-stock situations, frozen pies have gone over so well the store also plans to pack and quick freeze its own pre-cooked shrimp and pizzas. The frozen pies are well displayed in a 9' ice cream case across from the baked goods department. The frozen pies sell for 39 cents and the fresh baked for 43 cents.

"**AUTOMATION TECHNIQUES**", especially as applied to air conditioning, can be utilized effectively to increase operating efficiencies of apartment living, W. T. Gove, manager of apartment activities for Minneapolis-Honeywell Regulator Co., recently told the National Apartment Owners Association. Gove described centralized master control systems for controlling heating and cooling equipment in all parts of the building. Integrated with the master panel could be individual apartment "service centers", he explained, containing heating and air conditioning controls, as well as tenants' telephones, front lobby communication, door-locking controls, light switch, and fire and prowler alarm.

AIR CONDITIONED WALKS will connect all units of Exchange Park, a city-within-a-city business community now being built in Dallas. A separate maintenance building will supply all heating and air conditioning for the project. Eventual capacity of this cooling plant will be 12,000 tons of air conditioning. The enclosed malls or pedestrian streets will be landscaped completely with planters, shrubs, and small trees. Through continual planting and the aid of controlled temperatures, these walkways will be maintained as year-round garden areas.

This refrigeration distributor devised his own

SERVICE ANALYSIS FORM

He finds it provides all the information he needs in order to keep his service operations running consistently "in the black"

WE never made a consistent profit in our service department until we started analyzing the work of each individual serviceman, week by week." That's Donald D. Denny talking. He's president of Modern Market Fixtures, Inc., Dayton, Ohio, distributor of commercial refrigeration equipment.

And that one brief statement explains why, about a year ago, Denny instituted a thoroughgoing program of service analysis that has put his firm's service operations steadily "in the black" ever since that time.

"We simply got tired of putting up with all the necessary work and inevitable headaches of operating a service department merely as an accommodation for our customers," Denny declares. "We decided that service wasn't worth handling if we couldn't make a profit on it, so we determined to put this department on a paying basis."

As a result of this decision, Denny set to work to devise a service analysis form that would give him all the information he desired. After considerable study and experimentation, he worked out the form reproduced with this article, and had a supply printed up by the same organization that prepares the rest of the firm's office forms.

Prime purpose of this form is to provide the company's management with a detailed and accurate picture of each serviceman's weekly operations, culminating in an all-important figure that shows whether the company made or lost money on that man's week of work.

One of these service analysis sheets is used to record the activities of each serviceman each week. Space for the man's name and the week covered by the report is provided at the top of the sheet. Vertical columns are provided for recording the date and identification of each call handled, plus the service ticket number of each job.

Balance of the sheet is divided into three sections, under these headings: "Service Sales; Installation & Warranty; N/C—Call Back. Columns are provided for entering the cost of material, labor, and mileage under each of these three service call classifications.

Posting of the necessary data on these sheets is done by the service manager as job tickets are turned in by the individual servicemen throughout the day. Then at the end of each week the service manager checks this data against the daily time sheets for each serviceman, just to be sure that no entries have been omitted.

Column No. 1 of the service analysis form records actual service paid for by the customer. Column No. 2 indicates service for which Denny's organization would have to pay if service were contracted to an outside source, but represents no money coming in. Call backs are charged to the man making the original call,

not to the man running the call back, although an effort is made to have each man handle his own call backs insofar as possible.

The total income figure shown at the bottom of the form is arrived at simply by adding together all material, labor, and mileage charges shown in Columns 1 and 2.

Total material cost is computed at 50% off list. On service materials, the amount shown for each job on the analysis sheet is the price actually paid by the customer, so a straight 50% of this figure is used in calculating total material cost.

Installation materials, on the other hand, are billed to each job on the sales breakdown form at 25% off



CHECKING discrepancies on the weekly service analysis sheet of one of the company's servicemen are owner Denny (left) and service manager John Lesko.

list, as part of the cost of the sale. As this already discounted figure is the one shown on the service analysis form, another 33-1/3% is deducted in computing total material cost, so that installation material costs will conform to the same "50% off" pattern established for service materials.

Labor charges shown in Columns 1 and 2 represent the amounts actually charged to the customer. This figure naturally includes a normal profit percentage. In computing total labor costs, however, servicemen are charged with only what the firm would have to pay if its service was being contracted on the outside. Ac-

SERVICE ANALYSIS FORM

tually, therefore, the amount shown in the labor cost computation at the bottom of the page represents the man's actual gross payroll figure for that week, prior to deductions.

Mileage charges tallied on the service analysis sheet again are the amounts charged to the customers, whereas the total mileage cost shown at the bottom of the sheet is the amount actually paid to the serviceman. This is arrived at by taking the mileage figure off the daily time sheets turned in by each man and multiplying it by the fixed mileage allowance established by the firm.

Incidentally, the allowance paid to men driving their own cars is the same as that charged off for those driving company-owned vehicles.

The total cost figure shown at the bottom of the sheet, of course, is simply the sum of the total material, labor, and mileage costs previously computed. This figure, subtracted from the total income figure, clearly reveals how much the firm has profited from the work accomplished by that serviceman during the week in question.

Conversely, of course, on those rare instances when the total cost figure exceeds the total income figure, the company's management can quickly see just how much the firm has lost on that man's labor for the week.

Profit Variations Are Checked Closely

Inevitably there sometimes is a fairly wide variation in the profit figures shown by the company's servicemen during the course of any one week. This is attributable to a number of factors, one of the most dominant of which is the type of work to which each man was assigned during the week.

Installation work, for instance, is billed to the customer at \$3.50 per hour, while straight service labor is billed at \$4. Thus a man assigned principally to installation work during any particular week would tend to show a lower total income figure, and consequently a lower profit, than a man who had put in a corresponding amount of time running straight service work.

By the same token, no credit for materials used on jobs in progress is posted on the service analysis sheets until the job is completed. It is easy to see that this, too, would cause considerable fluctuation in each man's weekly profit picture.

Denny takes all of these known factors into consideration in studying each week's service analysis sheets. He first scans the total profit (or loss) figures, carefully, weighing any obvious discrepancies to determine whether or not there is a legitimate reason for them. If any sheet reveals factors which seem out of line and which cannot be readily explained, he calls in the service manager and the serviceman in question to determine the reason for these variances.

He also checks closely on the figures in Column No.

3, which covers the "No Charge" calls. While these figures do not actively enter into the profit or loss computations, they nevertheless constitute important indications of possible trouble spots in the firm's overall service operations.

Denny makes it a particular point to see that these weekly analysis sheets are brought up for discussion frequently at the company's service meetings, not only when certain items may seem out of line and in need of correction, but also whenever commendation or compliments are in order for the results achieved by any particular serviceman.

Finally, after they have served their immediate purpose, each week's group of service analysis reports are placed in the company's permanent files for possible future checking and comparison.

Idea Took Time To "Catch On"

This service analysis plan was first placed into effect in August 1955, but Denny freely admits that the year was almost over before the idea really caught on. "At first," he says, "our service manager regarded this form as just one more unnecessary piece of paper work for him to handle."

"Suddenly, however, the servicemen themselves began to develop an interest in these reports. They started comparing notes, and actually became quite jealous of each other's profit records as indicated on the weekly analysis sheets. Aware of the fact that their weekly activities were being closely checked, they began to realize that they wouldn't be able to continue to justify their salaries if their service operations should show a consistent loss to the company."

"As a result, each man began to 'police' his own activities a little more carefully. Now they all keep on their toes just a little more in an effort to cut down callbacks and lost time for which they receive no credit. They seem to have less of a tendency to 'get lost in the basement' when they return to the shop. Instead, they actually vie with each in their enthusiasm to go out on other calls."

Improved Efficiency Brings Better Pay

"Most importantly of all," Denny declares, "each of the men has had a pay raise since this service analysis program was placed into effect. We feel that since the company is now making a consistent profit on the efforts of these men, they are certainly entitled to share in it. Further increases will be granted on this same basis as conditions warrant."

While Denny has been quite pleased with the results achieved so far by this service analysis form, he does have one change in mind which he feels will make it even more helpful to the company's management.

"We now plan on splitting the installation and warranty figures, instead of lumping them together as we have been doing," he explains. "These figures are not handled separately in our bookkeeping, so separating them on the analysis form would enable us to learn just how much our warranty operations are costing us."



309 LINEAL FEET of self-service refrigerated fixtures—most of them low temperature cases for frozen foods and ice cream—make this Warren, Ohio, dairy store an outstanding example of modern food merchandising.

The Store with More?

A REMARKABLE 276 linear feet of self-service, low temperature fixtures for the display and sale of frozen meats, other frozen foods, frozen baked goods, and ice cream is the proud boast of the Warren, Ohio, retail store operated by McAllister Dairy Farms, Inc.

In addition, 33' of normal temperature, self-service, double-duty wall cases are used for displaying, merchandising, and storing dairy products and luncheon meats. This boosts the store's grand total of refrigerated cases to a whopping 309 lineal feet.

Of the low temperature equipment, 221' is in the form of continuous island display. These fixtures, in 8 and 11' lengths, have shopping fronts on both sides. They are installed in six separate islands, with ample shopping space all around each line of cases.

One 38' island with a capacity of 83 cu. ft. is completely devoted to the display of frozen baked goods. The other five islands, totaling 183' in length and 556 cu. ft. in capacity, are devoted to the display of 12,000 pounds of frozen meats (fresh, luncheon, and smoked) and 3000 pounds of other frozen foods. These cases are stocked alternately with a section of frozen meat and then one of frozen food, a radical departure from the common practice of grouping all like products together.

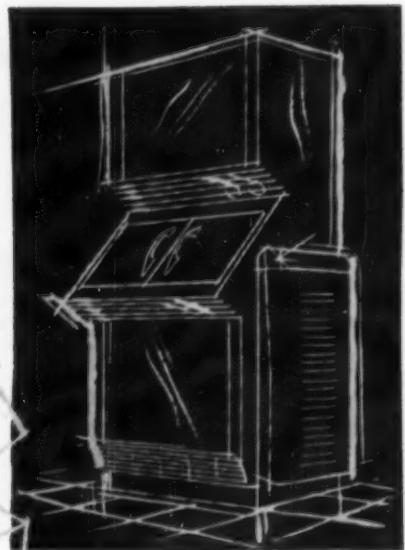
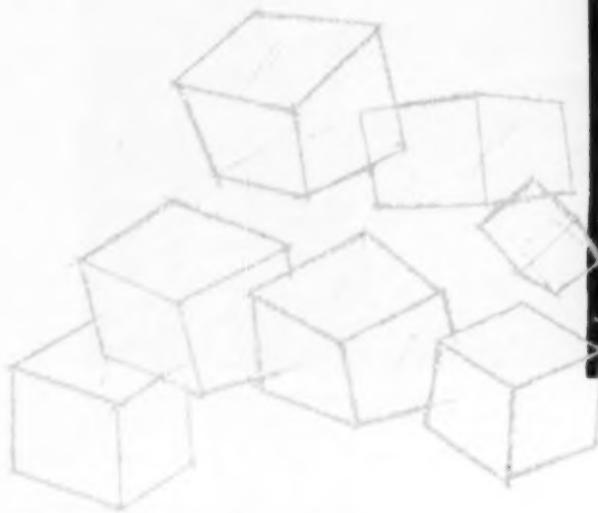
The McAllister organization makes and packages its own brand of ice cream. The Warren store uses 55 lineal feet of low temperature, self-service wall cases for

the display and sale of this product. These cases have a total capacity of 8160 pint packages.

All of the low temperature fixtures are equipped with automatic electric defrost. All of the wall cases — both low temperature and normal temperature — have low, lighted superstructures for the display of related items. Every case in the store is finished in pastel green.



WALL CASES with lighted canopies for display of related but non-refrigerated products are used in the ice cream section.



Ice Makers Needn't Be a Service Problem

A proper program of preventive maintenance can pay big dividends by licking many service problems before they arise

AVOIDING serious service problems with automatic ice makers is largely a matter of setting up and following a sound program of preventive maintenance.

A good maintenance program, if followed faithfully, can virtually eliminate service calls.

This program should begin right when the automatic ice maker is installed. If few important check points are observed at the time the equipment is started up, proper operation can be assured from the very beginning. Here are major points that should be checked:

1. Water valve setting. This should be checked to make certain that the proper amount of water is reaching the condenser, so that operating head pressures can be maintained at the level desired.

2. Level of the machine should be checked, to assure uniform size of cubes delivered by the unit.

3. Bin thermostat setting should be checked. This is to assure that the machine will shut off when the bin is filled with ice cubes.

4. Float level on water pan should be checked, to regulate timing of the ice cycle. Too low a water level requires longer pump action to fill the machine and lengthens the ice cycle. Too high a level, besides wasting water through overflow, also lengthens the ice cycle.

5. Hold-down bolts on the compressor should be loosened, so that the compressor rides smoothly on its springs and operates as quietly as possible.

6. Voltage should be load tested and checked against nameplate voltage.

7. See that the machine is clean, inside and out.

It should be a part of standard installation procedure to run the machine through at least two or three complete cycles of ice production. Most of the problems which are apt to arise in the strict mechanical operation of the ice maker will become apparent during this initial test run.

Equally important, any foreign matter within the ice chamber will be disposed of during this preliminary operation. This will give the customer clean ice right from the moment he begins to use his new equipment.

Carefulness of this sort when

making the original installation will go a long way toward reducing service calls to a minimum. However, even with the most careful attention, some service problems may be expected with ice makers, as with any other type of mechanical equipment.

Service problems usually encountered generally break down into three main categories. Difficulties with the electrical system will generally constitute the principal service problem. The second major cause of faulty operation is water problems, most of them associated with scaling. In the third category are the general refrigeration circuit problems, common to all refrigeration equipment and requiring no special mention here.

Don't Tamper with Controls

If there is one "Don't" that applies to dealing with ice making equipment, it is this: "Don't tamper with the control arrangement unnecessarily. Probably more trouble arises from violation of this rule than from any other single cause.

Naturally, instances will arise when control adjustments will be necessary. However, before tinkering with the control arrangement, consult the manufacturer's instructions and be sure you understand what you're doing. Every manufacturer of ice making equipment issues detailed instructions on all points having to do with control adjustment. Study these instructions before you go ahead.

Use Continuity Checks

This applies to all types of control equipment — thermostats, water valves, etc. Many times, thermostats lose their calibration because of scaling of the thermal bulb; so, before resetting a thermostat, check and clean its bulb.

Ice maker circuits are rather intricate, and a thorough knowledge of these circuits is most important. Most electrical troubles can be diagnosed by a knowledge of the cycle and continuity checks.

As stated above, a good maintenance program will virtually eliminate service calls. During the

Continued on page 100

This Dealer's Servicemen

Double as Demonstrators

. . . . do yours?

IN these days of rapidly increasing operating costs, it is wise for the commercial refrigeration dealer to re-evaluate his personnel schedule to make certain that he is obtaining maximum returns from each name on the company's payroll. At least that's the feeling of John T. Higgins, operator of Kentucky Refrigeration, Inc., in Louisville.

An excellent example of this type of cost-cutting is a series of training classes held by Higgins for 12 persons on his staff. This training was specifically designed to make each man not only more efficient at his basic job but also qualified to "fit in" to other operations as necessary.

As a case in point, all delivery and installation men were given thorough instruction in the use of each type of refrigeration equipment sold by the company. Factory experts were called in to give a complete demonstration of each product, outline its usefulness to the customer, cite its selling points, and highlight the do's and don'ts of any maintenance problems that might be connected with it. Employees were encouraged to ask plenty of questions, so as to make certain that each man had a thorough understanding of every product line.

"We have found that we derive a number of advantages from investing a few hours a week in training of this nature," Higgins reports. "First, of course, when the delivery man or installation mechanic knows precisely how each particular piece of equipment should be employed for most satisfactory service to the customer, he can do a better and more intelligent job of handling the installation.

"Then when, upon completion of the installation, he immediately launches into an elaborate demonstration program designed to inform the customer of all the factors which should be taken into consideration if he wishes to derive maximum returns from his equipment investment, he promptly engenders a feeling of good will toward the company. Thus in the future the customer is more likely to make repeat purchases of the same or a similar type of equipment — and from the same dealer.

"One of the direct results of this program," Higgins points out, "has been an actual lowering of sales costs due to the fact that it no longer is necessary to send out a salesman to make a 'location demonstration' after the equipment has been installed. Because of their newly acquired product knowledge, our installation men now are able to handle this assignment.

"What's more," he concludes, "our service operations have been improved through elimination of a great many 'nuisance' calls of the type which most often occur when the customer simply doesn't understand how to use his new equipment properly."

Do your installations have a "professional" look?

Details Make the Difference

AUSTIN A. HILL, commercial refrigeration and air conditioning contractor of Fort Wayne, Ind., is a firm believer in the fact that the most effective possible advertising for his services is the obvious high quality of each job he installs.

"Don't ever put in an installation," he advises, "that you wouldn't be proud to show off to any prospect as an example of your work. This applies not only to the 'up front' part of the job, but also to every detail of the mechanical work behind the scenes.

"In fact," he points out, "these behind-the-scenes details really are the most important part of the job, from this standpoint. Even the most incompetent 'wrench jockey'

can shove a bunch of new fixtures into place and make them look presentable, but the nature of the mechanical work down in the basement or out in the back room quickly reveals whether or not the installation was made by a man who really knew his job."

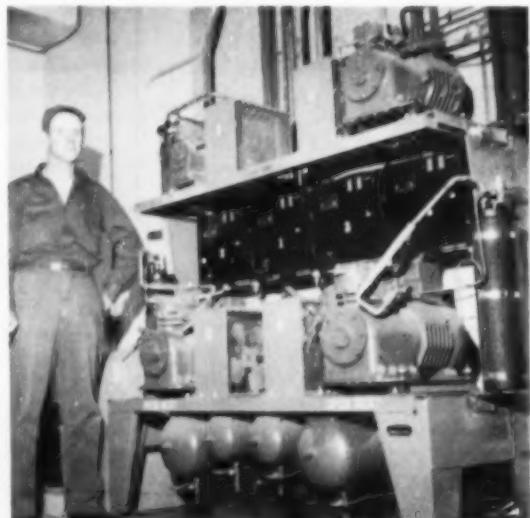
A typical case in point is the installation made by Hill at the Wayne Street store of Bazley Meat Markets. Here Hill installed 60' of self-service double-duty meat cases, 16' of double-duty service type case, 10' of smoked meat case, 12' of dairy case, 8' of frozen food case, and 32' of refrigerated conveyor leading from the cutting room which is held at 46 to 50 F by four 12' x 24' gravity coils.

In this part of the job, com-

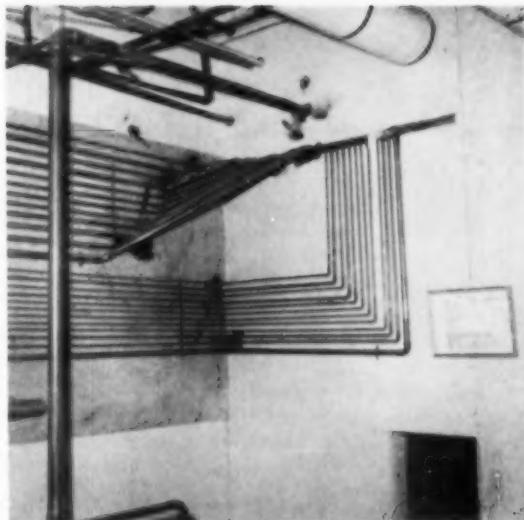
petent craftsmanship simply doesn't show up. But down in the basement machinery room, where a dozen semi-hermetic condensing units ranging in size from $\frac{3}{4}$ -hp to 3-hp are lined up, connected to their various fixtures and to the two 20-ton multiple circuit air cooled condensers on the roof with a total of 4921' of hard drawn tubing, that's where Hill's meticulous attention to detail becomes immediately — and conspicuously apparent.

The pictures on these pages offer ample evidence of some of the reasons why Hill feels he can justifiably "point with pride" to any installation he completes, and use it as a powerful "convincer" in selling future jobs.

CAREFUL CODING of each condensing unit with the type of fixture for which it is providing service, and numerically matching it with its own electrical control panel, simplifies service by personnel unfamiliar with the installation. All compressors are mounted on 4" I-beams to compensate for unevenness in basement floor. Actually, Hill admits, it is easier to mount them this way — and besides, it results in a better job. Vibration pads are used as needed.



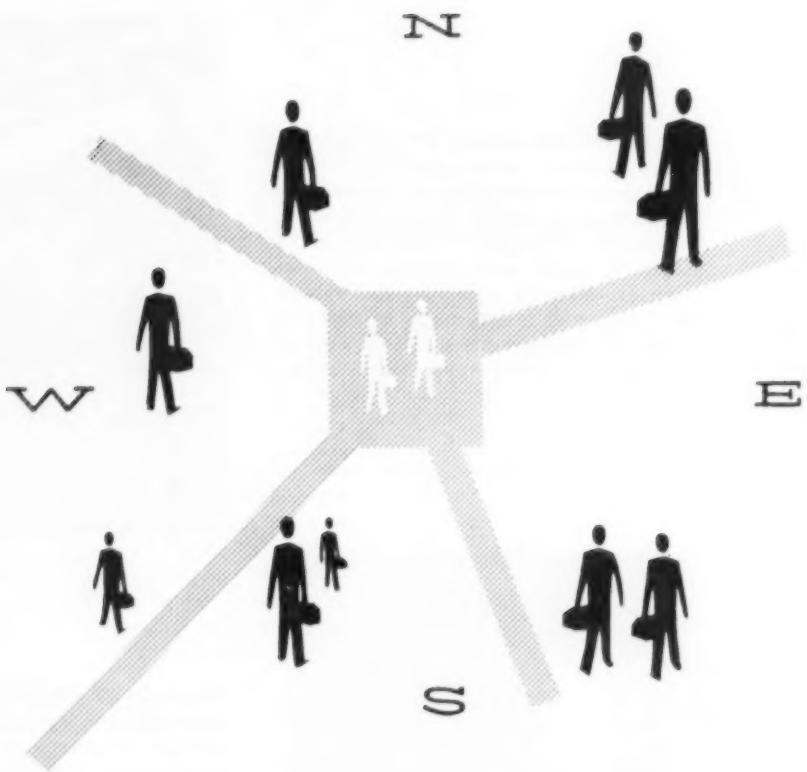
SOME SEMBLANCE OF ORDER is a "must" when you're running nearly 5000' of hard drawn copper tubing on a single job, if you want to keep it from looking like a handful of wet spaghetti thrown against the wall. All bends were machine made for neatness. Plywood panels erected against the plasterboard wall made it easier to fasten the tubing. Framed coding chart on wall at right identifies the various refrigerant circuits.



BETTER VENTILATION for the machinery room is provided by converting an old alley window into a fresh air intake. The expanded metal screen prevents blowing papers or other waste from entering the equipment area. Hill decided on this treatment for outside air in preference to bringing it down a dirty stair well because he thought it would keep condensing units cleaner, as well as providing better ventilation.

PROTECTED AGAINST DAMAGE from alley traffic are the refrigerant lines running from the compressors in the basement machinery room to the air cooled condensers on the roof of the two-story building. The protecting shield is built up of 6" angle iron covered by boiler plate. It is only a 48' lift from the machine level to the roof, but it is 128' from the farthest compressor to the condensing unit connected to it.





Want to cut down lost time? Increase the number of calls per man per day? Boost total volume? Up your profit margin?

ZONE YOUR SERVICE CALLS

GEOPGRAPHICAL "zoning" of refrigeration and air conditioning service operations may not be exactly new, but few firms have employed this system as long or as effectively as United Refrigeration Service, Inc., in Columbus, Ohio.

This firm, which started out in 1935 as a strictly service organization, has made giant strides during its 21 years in business. "Our first year we billed only \$43,000," reports William H. Boye, secretary-treasurer, "but we have grossed over \$1 million in each of the last two years." While the company

long ago branched out into the sale and installation of commercial refrigeration and air conditioning equipment, approximately 40% of its total volume still comes from the service end of the business.

"Like most other service firms," Boye points out, "we had long been concerned about the excessive amount of travel time which our men seemed to be logging during the course of each day's calls. We considered a number of solutions to this problem, but none seemed to offer the desired answer.

"Finally, about 10 years ago,

we decided to try a new approach. We divided the city arbitrarily into five geographical areas — north, east, south, west, and a central 'downtown' zone. Then we specifically assigned one or more of our servicemen to each of these zones, in accordance with our estimates of the service load in each area.

"At present we have 12 men working on commercial refrigeration and air conditioning service. Two men are assigned to each of the five zones, with the exception of the north zone where the load is unusually heavy and we have three men. The twelfth man is

used to handle calls in fringe areas, and to fill in wherever extra help may be needed as the volume of calls varies from zone to zone.

"This arrangement is not entirely inflexible," Boye points out. "If current conditions impose a particularly heavy service load on any one area, we simply pull a man from another district temporarily until the load conditions stabilize again. We have found over a period of years that sometimes service volume will shift between the various zones as new shopping centers or similar developments involving a lot of cooling equipment open up. When such load shifts become apparent, we just reassign our service personnel to meet the new conditions.

Stay Away from Home

"The men are assigned to their respective districts on an arbitrary basis," Boye explains, "with one exception. We try never to put a man to work in the same district in which he lives. We feel that such an arrangement would provide too much of a temptation to 'goof off' during working hours."

All United servicemen report in to the shop first thing in the morning to receive their initial assignments. Then they have instructions to call in periodically throughout the day to receive additional service calls. They are not required to check in to the shop again at night. Instead, they simply telephone the dispatcher when they have completed their final call, and then are allowed to go directly home if there is no more work for them.

More Work, Less Waste

"In this way," Boye points out, "we get a maximum amount of actual work time and a minimum amount of travel time out of each man. Consequently, this has resulted in more calls per man per day, which in turn means an increased total volume of service business and a corresponding rise

Continued on page 107

Portable Radiant Gas Heater Licks

Cold Weather Installation Problem

COLD weather installations no longer prove a headache to Kiefer Sales & Service Co., veteran refrigeration and air conditioning contracting firm in Belleville, Ill. Not since the firm made a modest investment in a novel type of portable butane gas heating equipment which keeps the workmen comfortably warm on the job, regardless of surrounding temperature conditions.

L. H. Kiefer, head of the firm that bears his name, has long made a practice of intensively promoting air conditioning installations during the winter months, so that these systems will be completed well before warm weather arrives. While this program offers the obvious advantages of building off-season business and taking some of the pressure off of the firm's hot weather operations, it also raises a new set of problems faced by installation crews in their attempts to carry on their work during below-freezing weather.

Keenly aware of today's high cost of installation labor, Kiefer keeps continually on the lookout for anything that might help his crews perform their tasks more quickly or efficiently. Consequently, when he discovered several marked instances of job slow-downs due to cold weather, he searched the market for some form of heating device which would concentrate its warmth where it was needed, without wasting a high percentage of it in open space.

He found his answer in the Schwank "Infra-Red" gas heater, a unique device developed in Germany and marketed in this country by Perfection Industries, Div. of Hupp Corp. He promptly purchased two of these units of the portable type and put them to immediate use.

Each of these units consists of a panel comprised of perforated ceramic burners recessed in a radiating aluminum reflector. This entire burner head is mounted on a vertical standard in such a way that it can be adjusted to any height up to 10' above the floor or ground, clamping securely into place at any level. This standard, in turn, is mounted on a pair of wheels and is equipped with a pair of handles to make it completely portable. At the rear of the standard base is a small platform on which the pressurized cylinder of butane gas rests.

Each of these heating units will operate for approximately 100 hours on a 100-lb. drum of butane gas, and each will heat an area of approximately 200 sq.ft. The infra-red rays emitted by these heaters warm only the objects they touch, not the intervening air. The heating units can be used equally well inside a building or outdoors.

Total cost of this equipment was somewhat less than \$250, and because of the fact that the heaters make it possible for installation work to proceed at the same rate in December as in July, regardless of temperature conditions, Kiefer terms this investment one of the best ways he has found of improving his organization's operating efficiency.

COMMERCIAL REFRIGERATOR SALES NEWS

NCRSA Completes Plans for 10th Annual Convention at San Francisco Dec. 3-4

COMMERCIAL refrigeration distributors attending the 10th annual convention of the National Commercial Refrigerator Sales Association, Dec. 3 and 4, should witness one of the most stimulating and informative meetings ever staged by this group. Current and critical problems of the industry will be discussed by three well-staffed panels at Hotel Mark Hopkins, San Francisco.

Participating in the two-day program will be some of the nation's top executives of commercial refrigerator manufacturers, including: H. N. Corbin, general sales manager, C. V. Hill & Co., Inc.; J. W. Krall, president, McCray Refrigerator Co., Inc.; J. A. Brinkoeter, 1st vice president, Friedrich Refrigerators, Inc.; Ray L. Greene, sales manager, Tyler Refrigeration Corp.; and R. N. Matingly, secretary-treasurer, Hussman Refrigerator Co., Ltd., Brantford, Canada.

Also scheduled to speak during the panel discussions are: Fred E. Jacob, NCRSA director and head of Jacob Market Equipment, Los Angeles; Robert L. Allen, general credit manager, D. Ghiradelli Co., San Francisco; R. Y. Mann, sales manager, C.I.T. Corp., San Francisco; and D. P. Boothe Jr., president, Boothe Leasing Corp., San Francisco.

Ray Winther, president of R. H. Winther Co., San Francisco distributor of commercial refrigeration equipment, is serving as convention chairman.

Various phases of distributor operations will be studied by the three panels, with the discussion themes being, "If I Were a Distributor", "To Protect Your Profit", and "Does a Complete Line of Food Store Equipment Enhance a

Distributor's Service and Profit?"

Typical of the separate topics are: Engineering services, pricing standards, service department operations, supermarket activities, financing methods, credit risks, and the leasing of equipment.

Panel members in each of these discussion groups will elaborate on these individually selected subjects directly related to the main topics.

A special educational feature will be a film showing new offices, showrooms, and warehouses of as-

sociation members who recently have remodeled their quarters.

Distributors in the San Francisco and Pacific Coast area have planned a reception Monday evening, Dec. 3, preceding the association's annual dinner.

DISTRIBUTOR SALES UP FOR FIRST SIX MONTHS

Increased sales for the first six months of this year, as compared with the same period in 1955, have been chalked up by 79% of the distributor members reporting to National Commercial Refrigerator Sales Association in its periodic survey of distributor activity. Some 66% of the reporting distributors indicated an increase in net profit during that same period.

Total dollar sales for the six-month period showed an average increase of 29.21% for the distributors reporting, while the increase in net profit reported averaged 35.79%.

Continued on page 114

STORE PLANNING FOR STORE OWNERS



THE DO-IT-YOURSELF FEVER now has invaded the store planning field with the announcement by Tyler Refrigeration Corp. of its new copyrighted "Floorcaster", a self-service food store floor layout planning device developed for use by the market operators themselves. This unit consists of a layout sheet of heavy paper imprinted with a graph scaled $\frac{1}{8}$ " to the foot, plus a complete set of detachable, die-cut, 2-dimensional replicas of all types of Tyler food store equipment. These replicas are backed with a special type adhesive which permits the user to re-arrange the dummy fixtures as often as desired. The Floorcaster is part of the new Tyler Store Plan Kit \$1, which also includes a "color compatibility system" to help store owners plan the color scheme for new or remodeled markets. The complete kit is available from Tyler at a cost of \$1.

New Carrier Machine Creates a New Kind of Ice...

CHIPS!

Carrier Chipmaster above is water cooled, has 500-lb. capacity. Air cooled model has 400-lb. capacity, at 90 degrees air, 70 degrees water, temperatures. 34" wide x 75" high x 30" deep. Storage bin capacity: 200 lbs. $\frac{1}{4}$ -hp. hermetic compressor. Models for 110 or 220 volt A.C.



A new, versatile kind of ice... crystal-clear chips... is here to put you in the chips! When ice is as easy to sell as this ice is, then the machine that makes it has "best seller" written all over it, too!

This Carrier Chipmaster is the first and only Icemaker on the market to make thin, flat, clear chips of solid ice... that pack well, are easy to scoop and pour. Scores of uses in icing all kinds of drinks, or in adding appetite appeal to salads, food displays, seafood, meats—in lunch counters, cafeterias, restaurants, motels, hotels, hospitals.

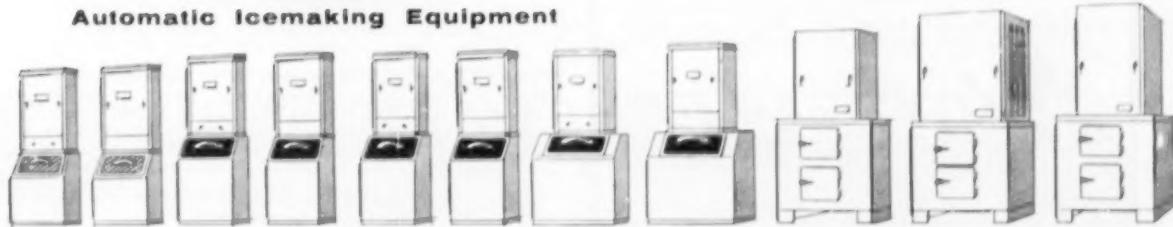
The Chipmaster rounds out the most complete line of Icemakers on the market. When you sell the Carrier line you can give your prospects any kind of ice... including the Icemaker for cubes and three grades of crushed ice... the Flakemaster for dry, extra-cold flaked ice... and the new Chipmaster!

Certified capacity, too! Here's your built-in Carrier sales clincher. It's a written pledge that the unit will deliver a specific amount of ice under actual local temperatures of water and air... your customers know exactly what they're getting!



Carrier

Automatic Icemaking Equipment



Do you want to get in the chips? Call Carrier! You'll find your Distributor listed in the Classified Telephone Directory. Or write: Carrier Corporation, Syracuse, New York.

Circle No. 37 on Reader Service Card

*Give your sales a boost
with these two
**BIG PROFIT
MAKERS!***

**Pinnacle SINGLE DUTY
SELF SERVICE CASE**



Here is the most-wanted Fruit and Produce Self Service Case on the market, believe us! It has all the features grocers want:

- Large storage and display areas.
- Removable storage bins.
- Quality construction — gleaming white life-time Porcelain on exterior front, ends and wearing surfaces.
- Fluorescent lighting.
- Low operating cost, etc. Then too — it goes through 36" doorway! Refrigeration in top deck at slightly higher cost. Comes in 6, 8, 10 and 12 foot lengths. Self-contained models also available.

**Pinnacle WALL TYPE
BEVERAGE CASE**



This Beverage Case literally has "everything" — beauty, economy of space . . . economical operation . . . best of materials . . . dependability — and best of all, it's most reasonably priced! Among its many features are better insulated doors and jamb that practically eliminate condensation and chance of short circuiting. Model WB526 (pictured here) is 6-ft. wide, 78" high and 30" deep with four sliding doors. It has 50 sq. ft. of shelf area and will hold 48 cases of 12 oz. bottles. Also available in 8 and 10 foot models in either life-time Porcelain or Stainless Steel.

A few Pinnacle Territory Franchises are still available. Wire or write today for full information and illustrated literature!

Pinnacle
EQUIPMENT CORPORATION
FLEETWOOD, PENNSYLVANIA
EXPORT DEPT.—39 Broadway, New York

Circle No. 38 on Reader Service Card

USEFUL

BULLETINS • BOOKLETS • CATALOGS

SPRAY NOZZLES and accessories are covered in Catalog I available from Monarch Mfg. Works, Inc. Expanded capacity charts and information on previous standard items plus numerous items newly added to the company's line are reviewed. Also featured in 20-page publication is complete line of strainers.

Circle No. 103 on Reader Service Card

COMPLETE DESIGN GUIDE (Catalog No. 155) for application and selection of bellows has been produced by Flexonics Corp. Convenient graph showing vapor pressure — temperature curves is supplied in addition to many illustrations and tables which help to describe metallic bellows and their uses. A step-by-step, illustrated feature outlines the production of bellows.

Circle No. 104 on Reader Service Card

DEAERATION FUNDAMENTALS and reasons why it is necessary in water conditioning are discussed in publication (4650) available from Cochrane Corp. Technical information in capsule form covers principles of operation as well as advantages and application of various methods of deaeration.

Circle No. 105 on Reader Service Card

VALUABLE CHARTS for calculating coil problems are incorporated in Refrigeration Engineering, Inc., water coil catalog (No. 53c6a). Charts include complete table of nominal ratings for the 4, 6, and 8-row coils and further charts show when coil is operating all wet, partially dry, and all dry. Also offered in catalog is chill-water selection method, augmented by a visual application of this method with a chart to determine gpm/circuit and head loss.

Circle No. 106 on Reader Service Card

FRACTIONAL-HORSEPOWER motor types and designs by Century Electric Co. are illustrated and discussed in 12-page booklet. Electrical types and characteristics of the performance-rated units along with ratings and dimensional charts are provided.

Circle No. 107 on Reader Service Card

WHAT IS "CAPILATOR"? This question and others are answered in leaflet for restrictor tubing, "Wolverine 'Capilator' —It's Precision Controlled", available from Wolverine Tube, Div. of Calumet & Hecla, Inc. Publication covers advantages of plug-drawn "Capilator" for metering flow of liquids and gases. It also highlights testing and control features, and what they mean for finished products in the refrigeration and air conditioning industries.

Circle No. 108 on Reader Service Card

TWO PARTS CATALOGS covering Henry Valve Co. products now are available. Catalog FPL consists of 32 pages of detailed cross-sections and parts, covering Freon valves and accessories, including packless and packed valves, check valves, strainers, driers, and liquid level gauges for refrigeration and air conditioning applications. Catalog APL-11 is a 24-page booklet describing ammonia valves and accessories.

Circle No. 109 on Reader Service Card

SELECTION PRINCIPLES for choosing the right type of manometer (ranging from simple U-tube to ultra-precision models) are offered in Bulletin No. G-10 available from Meriam Instrument Co. Convenient, quick-reference guide discusses and illustrates instruments for pressure, vacuum—flow and liquid level services as well as electrical contactor-type and portable kits for field instrument calibration.

Circle No. 110 on Reader Service Card

MONEY-SAVING FEATURES of the "Scotsman Super Cuber" line of automatic ice machines are listed in Form No. SIMC-6, three-color folder produced by American Gas Machine Co. Drawings illustrate numerous applications, and model specifications are provided.

Circle No. 111 on Reader Service Card

INDEXED TECHNICAL MANUAL by Simpson Electric Co. covers complete line of electrical indicating instruments and test equipment on 88 pages. More than 800 different panel meters are described in special 37-page section. Meter movements are illustrated with exploded views. Also contained is information on ranges, scale lengths, calibration, pointers, terminals, deflection characteristics, and sensitivity of various meters. Thumb guides give quick reference.

Circle No. 112 on Reader Service Card

ROUGHING-IN DIMENSIONS of various models of beverage and water coolers help illustrate details of assembly in six-page brochure by Kelvinator Div., American Motors Corp. Capacities and dimensions of various units are listed for easy reader-convenience.

Circle No. 113 on Reader Service Card

(See page 80 for Air Conditioning Literature)

2 facts you should know

about
LA-CO[®]
FLUX
(REGULAR)
For All Soft Solders



- 1 NON-ACID—Safe for work and workers.
- 2 SELF-CLEANING—Fluxes thru rust, oil, etc.

Yes, for surer, safer, faster work LA-CO FLUX offers an unbeatable combination. Its powerful fluxing action needs no scraping or wire-brushing—provides a perfect union of solder and metal. Yet it contains no acid—will not pit, corrode or stain metals or solder or harm workers. Try it just once and you'll be enthusiastic.

LA-CO specialized fluxes available for all needs. Let our research department help on any fluxing problem, without cost or obligation.

Your supplier has LA-CO FLUX; or write for sample.

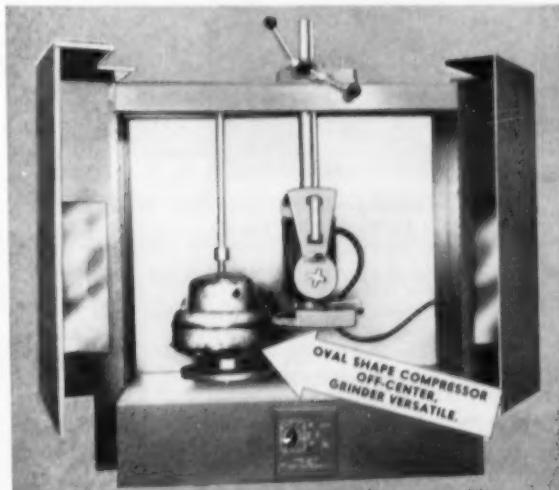
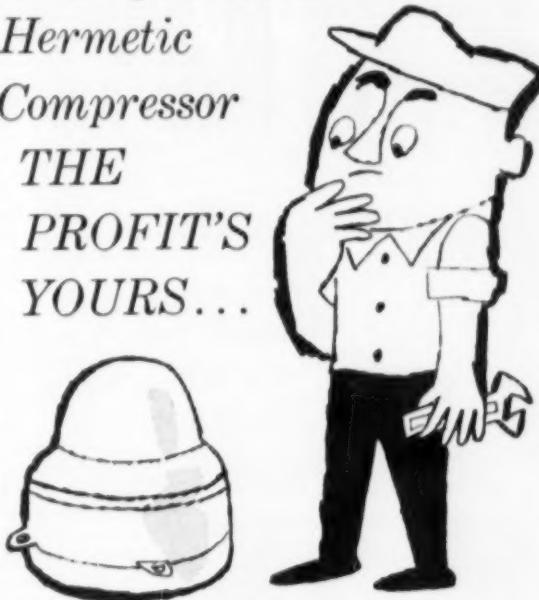


LAKE CHEMICAL CO.

3107 W. Carroll Ave., Chicago 12, Ill.

Circle No. 39 on Reader Service Card
& AIR CONDITIONING • NOVEMBER, 1956

When you **OPEN** this
Hermetic
Compressor
THE
PROFIT'S
YOURS...



With only minutes of a man's time... Frankell's Hermetic Compressor Opener will open any shape hermetic compressor up to 20" in diameter regardless of the position of the weld.

Whether your compressor is round, oval or irregular in shape; whether it is off center or on center; whether it is a top weld or a side weld; Frankell's Hermetic Compressor Opener will open it.

(pat. pend.)

For further information contact

FRANKELL MANUFACTURING CO., INC.
1074 HOME STREET, NEW YORK 39, N.Y. • WYANDOTTE 1-1322

Circle No. 40 on Reader Service Card

NEW PRODUCTS

For further information on any of these products, simply circle on the postcard provided in this issue the key numbers of the items in which you are interested. Your request will be forwarded directly to the companies concerned.

(For Air Conditioning Products turn to page 82)

Pocket-Size pH Meter

Product: Pocket-size pH meter for acidity and alkalinity measurements.



Manufacturer: Scientific Instruments Div., Beckman Instruments, Inc., Fullerton, Calif.

Features: Uses combination electrode. Has wide variety of applications. Ranges from 2 to 12 pH. Single electrode combines both reference and glass electrodes. "Memory" dial for standardizing. Operates on regular flashlight batteries.

Circle No. 137 on Reader Service Card

Tube-Connector Plug

Product: Self-sealing, automatic-locking, "push-on-pull-off" tube plug and connector. For processing of air conditioning and refrigerator circuits in line production.



Manufacturer: Mechanical Products Corp., Chicago, Ill.

Features: Provides fast, safe method of attaching pressure, vacuum, and charging lines to straight end tubing in either factory or field operations. No tools, threading, soldering, or brazing required. Insert $\frac{1}{4}$ " pipe plug to seal end of

connector for use as tube plug. Designed to operate at any pressure to 1000 psi and any vacuum to 25 microns. Efficient for air, water, steam, oil, Freon 12 and 22, and is suitable for temperatures from -40 F to plus 275 F. Available in three sizes for $\frac{1}{4}$, $\frac{5}{16}$, and $\frac{3}{8}$ " O.D.

Circle No. 138 on Reader Service Card

Thermostatic Valve

Product: Large-capacity thermostatic expansion No. 714 valve for refrigerant control.



Manufacturer: Detroit Controls Corp., Detroit, Mich.

Features: Field service made easier as discharged or damaged power elements are replaced on the job easily, manufacturer says. All parts are disassembled easily and can be removed for inspection or replacement without removing valve from line. Can be used with different refrigerants and for various capacities. Custom charges for air conditioning units, commercial and low temperature installations are available in interchangeable power elements.

Circle No. 139 on Reader Service Card

**BUY FROM YOUR
REFRIGERATION WHOLESALER**

Mobile Radio System

Product: Three high-power, low-band, two-way, mobile FM radio systems, "Carfone-50" line.

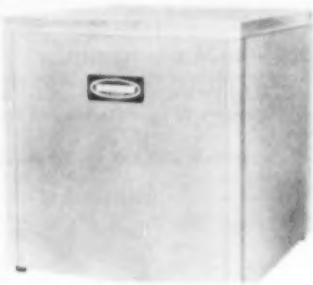
Manufacturer: Radio Corp. of America, New York, N. Y.

Features: Designed to provide extended and improved coverage and more economical operation in low-band radio communication, from 25 to 54 megacycles. Low transmit and standby battery drain. Included are CMF-100B Series, for 100-watt power output; CMF-55, for 55 watts; and CMF-40, for 40 watts. First RCA two-way equipment engineered for power output of 100 watts.

Circle No. 140 on Reader Service Card

"Instant-Ice" Machine

Product: Remote Model R-162, "Instant-Ice" machine.



Manufacturer: Liquid Freeze Corp., Oakland, Calif.

Features: Produces from 600 to 1200 lbs. of ice flakes per 24 hours, depending upon which of 6 condensing units is installed with it. Small in size for its flexible range of production, 30 x 30" high. Light in weight and convenient for installation where space is problem. Ready for installation with condensing unit.

Circle No. 141 on Reader Service Card

Produce Refrigerator

Product: Model SVIIR self-service fruit and vegetable refrigerator.

Manufacturer: Friedrich Refrigerators, Inc., San Antonio, Tex.



Features: Colors include shell pink, frost blue, mint green, golden yellow, and white. "FloatingAir" system controls circulation, humidity, and refrigeration. Available in 8 and 11' lengths with various 54 $\frac{1}{2}$ and 70" mirror super-structures. Sloped-in front puts everything with-

PROVED IN THOUSANDS OF INSTALLATIONS

LARKIN LOW TEMPERATURE HUMI-TEMP

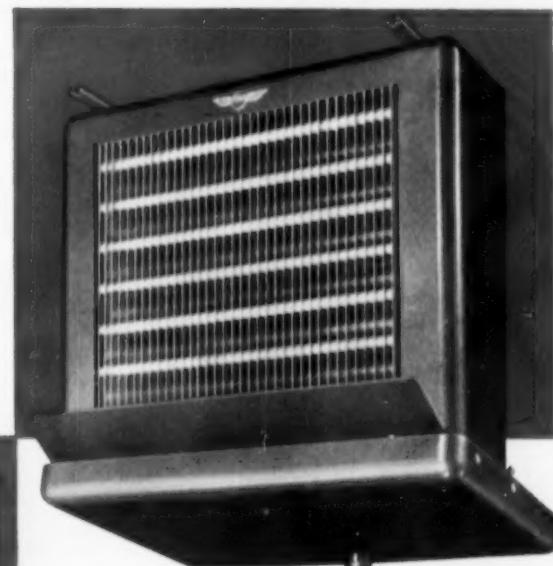
WITH **FROST-O-TROL** AUTOMATIC HOT GAS DEFROSTER

Thousands of installations the world over have proved the reliability and economy of the Larkin Low Temperature Humi-Temp with Frost-O-Trol Automatic Hot Gas Defroster.

The performance is high! The price is low! The installation is both simple and economical! Run one extra wire and one extra gas line and mount the compact timer. That's all that's necessary.

And the Frost-O-Trol is a honey of an automatic defroster. Defrosts from one to eight times each 24 hours. Takes the toughest jobs in stride—from minus 32°F sharp freeze rooms to 30°F meat storage rooms.

It will pay you to call your wholesaler now for complete information on the Larkin Low Temperature Humi-Temp with Frost-O-Trol Automatic Hot Gas Defroster!



SUCCESS IS BUILT ON THESE FEATURES

- Minimum temperature rise during defrosting
- Adjustable defrosting time and frequency
- No excess heat or moisture load
- Lower operating costs
- Higher efficiency of evaporator unit
- Heat applied throughout entire evaporator
- Melts frost from inside out
- Simple, low-cost installation
- Electrically heated drip pan assures positive drainage of melting ice and water — prevents freezing

COMES COMPLETE

Famous, top-quality
Larkin Low Temperature
Humi-Temp with factory-
installed metering orifice



DEFROST TIMER



HOT GAS SOLENOID VALVE



THERMOSTAT



LARKIN HEAT EXCHANGER



LARKIN COILS INC.
519 MEMORIAL DRIVE, S.E., ATLANTA, GA.—MURRAY-83171

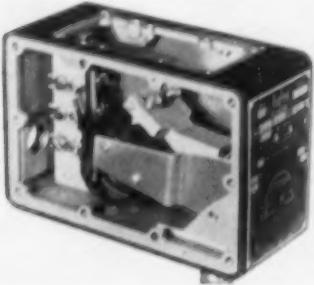
Circle No. 41 on Reader Service Card

in shopper's easy reach. Shelves may be adjusted when less merchandise is on hand. Stainless steel combination hand rail and basket guard rail affords protection against cart bumps.

Circle No. 142 on Reader Service Card

Temperature Controller

Product: Models F-1C, F-2C, and F-3-C, differential expansion-type temperature controllers.



Manufacturer: Burling Instrument Co., Chatham, N. J.

Features: Models include accurate on-off temperature control of heating operations, processes, equipment, safety alarms and cut-outs on similar installations, and combinations of control and alarm. Choice of one, two, or three snap-action switches on any instrument makes many unusual installations possible. Temperatures from subzero to 2000°F can be handled without difficulty. Adjustable ranges as wide as 1200 degrees in one instrument are offered. Operation is by difference in expansion of two concentric tubes when exposed to heat. Resulting movement is multiplied through lever arrangement which actuates one or more switches. Standard switch rating is 15 amp, 125-250 volt, AC. Higher ratings are available.

Circle No. 143 on Reader Service Card

Produce Shelves

Product: Refrigerated produce shelves for fruits and vegetables.

Manufacturer: Warren Refrigerators, Atlanta, Ga.



Features: Three adjustable bins for slanting displays of small items. Top of case becomes fourth-deck display for non-refrigerated items. Cubical content: 67.5 cu.ft. in 12' length and 45 cu.ft. in 8'; and 5.62 cu.ft. per linear foot. Acid-resistant

porcelain inside and out. Upper two slanting shelves are of slotted anodized aluminum. Bottom shelf is of close-meshed steel wire. Four rows of price rails. Liberal coiling is at rear of case for pick-up accessibility, with no danger of interference from refuse.

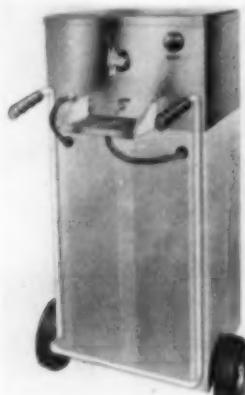
Circle No. 144 on Reader Service Card

Mobile Cooling Unit

attendant refreshment unit for special events.

Manufacturer: Neilson Equipment Co., Alhambra, Calif.

Features: Available for either 1/4 keg of draft beer or 5 or 10-gal. cans



of premix soft drinks. Space on inside accommodates gas cylinder, regulator, and waste receptacle. Cooling accomplished by use of ice in upper chest or to cooling plate or coil. Mobility permits many uses.

Circle No. 145 on Reader Service Card

Self-Sealing Coupling

Product: Self-sealing coupling (Series 5400) for applications of Freon-12 and 22.

Manufacturer: Aeroquip Corp., Jackson, Mich.



Features: Particularly suited for precharging air conditioning units with Freon. May be filled and charged with Freon for shipment with no loss of Freon during transit or extended periods of storage. No further bleeding or charging of Freon lines necessary at time of installation. Designed for easy bulkhead installation. Jam nut locks one section of coupling to bulkhead.

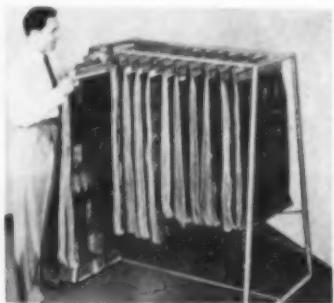
Adapters are recessed for brazing to copper tubing. Available in 1/4" through 1 1/2" O.D. tube sizes.

Circle No. 146 on Reader Service Card

Blue Print Rack

Product: Two giant sizes of blue print holders for use with "Glider" blue print rack in addition to regular size plan holder.

Manufacturer: Momar Industries, Chicago, Ill.



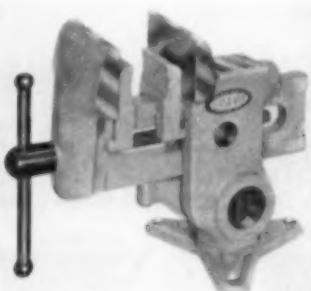
Features: Regular "C-1" standard plan holder is 24" long, but special sizes are "C-2", 36" long and "C-3", 48" long. Large size holders are available for use on regular rack. Holds any thickness of set, securely, without punching holes in prints. Whole sets or single sheets of print can be slipped into holder and clamped tightly. Any sheet in set can be replaced without removing other sheets. Each planholder clamp holds from 1 to 100 sheets. Clearly visible index shows location of sets. Any clamp holding prints can be slipped off its track and taken to table for use while prints still are in clamp.

Circle No. 147 on Reader Service Card

Multiple-Use Vise

Product: Multiple-use tool called "Versa-Vise".

Manufacturer: Will-Burt Co., Orrville, Ohio.



Features: Turns 360 degrees in either direction, standing or laid flat. Locked in any position by tightening jaws. Beefed up at all

Double crimp

Double crimp keeps DRYSEAL tube whistle-clean, bone-dry. Crimps are *tube-size*, too; slip easily through fittings. Dead-soft DRYSEAL means finger-easy, no-tool bending. Try it on your next job. Sizes $\frac{1}{8}$ " to $\frac{3}{4}$ ".



You'll like the job-size,
50 foot one-coil pack.

Revere Dryseal

COPPER REFRIGERATION TUBE

You'll find a Revere Distributor close at hand.

REVERE COPPER AND BRASS INCORPORATED, founded in 1801 by Paul Revere

& AIR CONDITIONING • NOVEMBER, 1956

Circle No. 43 on Reader Service Card

Circle No. 45 on Reader Service Card

Water-Cooled CONDENSERS

Widely known for fine performance and supreme dependability. Rated capacity under all operating conditions. Capacity charts available.

U.L. or A.S.M.E.
tagged
1/4 Ton to 15 Ton
FOR EVERY REQUIREMENT

Liquid RECEIVERS

Vertical and horizontal receivers designed especially for use where space is limited. All are rugged and moderately priced. U.L. or A.S.M.E. tagged. Constructed of heavy gauge tube with elliptical dished ends submerged—arc-welded to shells.

Adjustable

Capillary Valves
EASY TO INSTALL
CLEANABLE
EASY TO ADJUST
BUILT TO LAST
Capacities
1/20 to 1 H.P.

Replaces high and low-side floats, capillary valves and auxiliary expansion valves. Operates with most refrigerants and requires no receiver in the system.

Write for our NEW Catalog Today

STANDARD REFRIGERATION CO.

Offices: 332 S. Hoyne, Dept. B, Chicago 12, Ill.
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AUTO-LITE

for
EYE
LEVEL
READING

Auto-Lite Temperature Indicators are ideal for use in processing and storage rooms, and for installation on equipment where temperature indication is desirable.

Model F-1 (illustrated) is available with maximum visibility dial; choice of temperature ranges from minus 60°F. to plus 750°F.; flexible tubing for remote reading or rigid stem for direct mounting. Adjustable electrical alarm contacts slightly higher. **From \$23.50.**
Send for new catalog describing Auto-Lite Temperature Indicators and Recorders.

THE ELECTRIC AUTO-LITE COMPANY
INSTRUMENT AND GAUGE DIVISION
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NEW YORK • CHICAGO • SARNIA, ONTARIO

TEMPERATURE INDICATORS AND RECORDERS

Circle No. 44 on Reader Service Card

points of strain and offers removable serrated jaws for holding pipe or irregular objects. Broad, smooth jaws are for work that mustn't be marked. Used for most any type of work. Accessories include right angle adapter that provides tilt-type adjustment; flush base that inverts out of sight in bench top; and extra standard bases that make it possible to use tool in more than one location. Height, 8½"; width, 11"; jaw height, 2½"; jaw width, 3½"; and jaw opening, 5". Serrated jaws hold rounds up to 1½" in diameter. Circle No. 148 on Reader Service Card

ditions without job-site alterations. Internal leveling adjustment permits installation anywhere, regardless of position or availability of bolt holes in base, or of base thickness. No adjusting bolts protrude from top of mounting. Can be cemented to floor. Single piece assembly permits mounting and machine to be moved and relocated. Available in nine sizes for loads from 65 to 12,000 lbs. per damper. Circle No. 149 on Reader Service Card

Display Cases

Product: Models 336 (shown) and 616 merchandiser cases.

Manufacturer: Howard Refrigerator Co., Inc., Philadelphia, Pa.

Features: Both have mezzanine shelf, fluorescent lighting, and hermetically-sealed refrigerating system, fully removable from case in event of breakdown. Model 336 available in three styles: No. 1—open top self-service unit; No. 2—equipped with Formica top for part displays



Manufacturer: Korfund Co., Inc., Long Island City, N. Y.

Features: Speeds installation and relocation of all types of equipment, stops vibration transmission and lowers noise levels, manufacturer says. Will accommodate all job con-



of allied items, as well as slide-back glass door cover; and No. 3—with wide formica top-service counter 18" wide, and also display glass push-back cover. Model 616 also has display counter top and service counter top.

Circle No. 150 on Reader Service Card

Torque-Control Tool

Product: Size 5UT "Impactool" (electric hand power tool) which utilizes automatic torque control to run down fastenings to preset torque, then automatically shuts itself off.

Manufacturer: Ingersoll Rand Co., New York, N. Y.

Features: Reversible, with full power delivered in both directions. Selector knob controls automatic shut-off device. Rated capacity up to 5/8"-bolt diameter. Desired torque can be set by holding "Torsion Bar" in vise and with wrench turning bar to desired reading on calibrated sleeve. Setting may be made for either left thread or right thread torque. Two bars are available giving torque range from 20 to 90 ft.





SPORLAN VALVE COMPANY

7525 SUSSEX AVE., ST. LOUIS 17, MO.

Circle No. 46 on Reader Service Card

AIR CONDITIONING • NOVEMBER, 1956



**important
announcement
to United
brazing
customers**

If you are presently using United Phoson 15 alloy (government grade III) this is notification that a switch to Phoson 6, the most talked about brazing alloy in the country, will cut your costs at least 30 per cent with equal performance in every respect.

Extensive field tests—eight years of them—have proven Phoson 6 best for brazing copper and brass. Most of United's customers, 80 per cent, in fact, have already changed.

here's the story!

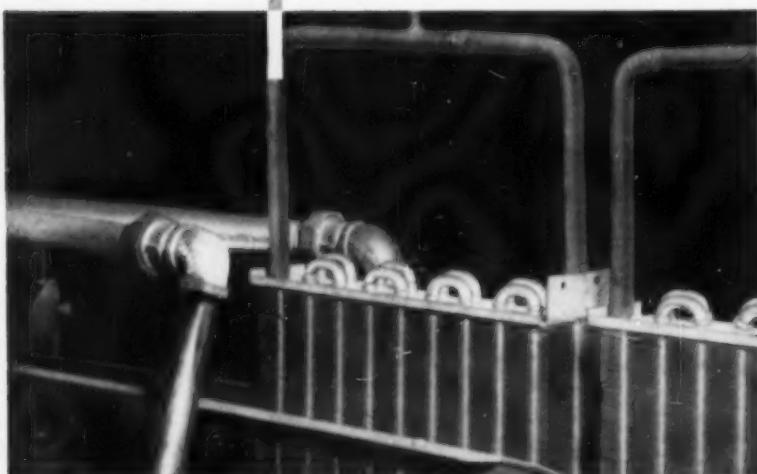
- Silver 6% Brazing Temperature 1300°
- Copper 87½% Original Tensile 92,000 PSI
- Phosphorous 6½% Rockwell 15T 86
- AWS BCuP 3

Write for the facts today.



UNITED WIRE
AND SUPPLY CORPORATION

PROVIDENCE 7, RHODE ISLAND



Circle No. 47 on Reader Service Card

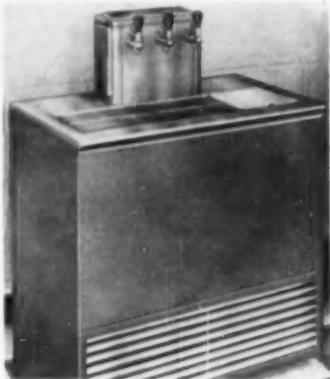
60

lbs. Torque setting remains constant for any nut-running operation until adjustment. Accuracy of torque eliminates need for checking it with hand wrench. Also eliminates stripping of threads or twisting off studs, since over-torque is impossible with automatic shut-off. Has $\frac{1}{2}$ " square drive. Weighs only $6\frac{1}{2}$ lbs. Operates on 110 or 220-volt AC-DC current. Circle No. 151 on Reader Service Card

Drink Dispenser

Product: Self-contained drink dispensing unit with carbonator, compressor, and syrup tanks.

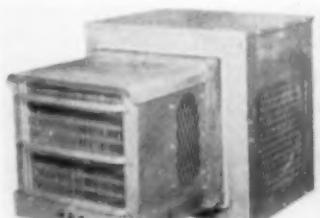
Manufacturer: Fischman Co., Philadelphia, Pa.



Features: Fully insulated and refrigerated. Delivers three flavors from 3-gal. pressurized syrup tanks in chill compartment. Extra syrup cold storage for five 1-gal. jugs. All steel framework. Self-contained hermetic compressor. Three automatic mixing arms refrigerated to point of service. Low-pressure regulator for dispensing syrups. High-pressure regulator for carbonating soda water. Circle No. 152 on Reader Service Card

Packaged Cooler

Product: Packaged cooler units requiring no special tools or technical knowledge to install and convert



old-type ice boxes and counters into modern refrigerated units.

Manufacturer: Taylor-Burch Refrigeration Products, Inc., Jackson, Mich.

Features: Interchangeable, and where necessary, multiple units may



\$ELL

an ice making machine
with real **SALES IMPACT!**

Chip-Freeze AUTOMATIC ICE FLAKER

A new 560 lb. daily capacity ice flaker that is fast becoming the number one salesmaker in restaurants, bars, hotels, soda fountains, groceries and all retail outlets that want and use ice making equipment. Here is the newest, the most scientifically designed unit on the market today. Easy to operate and trouble free, CHIP-FREEZE is priced below competition. Offer your customers the unit that is making sales history. Sell CHIP-FREEZE, the only ice flaker in its field that provides these outstanding sales features.

• **FOR ECONOMY . . .** Savings up to 95%. A full bushel of crystal clear ice flakes for as little as 2c or 6c per hundred lbs. (depending on local power and water rates). Pay only for the ice that you need. Low installation cost and easy maintenance makes CHIP-FREEZE the most economical unit on the market.



Send for complete
information and prices!

NO DEEP REACHING!

Sparkling
pure ice
is always
at your
WAIST LEVEL!

See us at the National
Hotel Exposition
BOOTH 228

• **FOR CONVENIENCE . . .** New NO DEEP REACHING DESIGN places ice at waist level . . . right at your fingertips for instant serving. Easy to operate, this space saving unit automatically turns itself on and off and is ideal for any water system.

• **FOR SANITATION . . .** No possibility of accumulation of ice that leads to scum, dirt and decay. CHIP-FREEZE produces ice at the top of the unit and enables you to constantly draw clean fresh ice from the lower part of the upper section of the sanitary, stainless steel storage bin. Newly produced ice then falls into place . . . ready for serving.

• **FOR BEAUTY . . .** Beauty pays off in sales appeal. The attractive CHIP-FREEZE space saving cabinet is available in a wide choice of decorator colors to harmonize with any interior. Easy to clean hi-bake enamel finish retains its luster for the life of the machine.

Gentlemen:	CRAC
I am interested in knowing more about CHIP-FREEZE Automatic Ice Flaker.	
Name: _____	
Firm: _____	
Address: _____	Phone: _____
City: _____	Zone: _____ State: _____

COCORA PRODUCTS
Designed and manufactured by
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be installed in any combination to handle large cooler capacities. Automatically defrost. Completely air-cooled with no water needed. No service required as units are hermetically-sealed with gas and oil charge brazed in. Fan motors have self-contained oiling system and electrical system is encased completely. In case of equipment failure, entire unit is simply exchanged.

Circle No. 153 on Reader Service Card

Merchandising Case

Product: Merchandising case for smoked meats and dairy products.

Manufacturer: C. Schmidt Co., Cincinnati, Ohio.



Features: Measures 6' 4" long, 34" wide, and 49" high, with two refrigerated shelves. Has 11 cu.ft. storage compartment with 17 x 30" door opening. Front glass is 2-light, hermetically sealed. Condensing unit is 1/2 hp.

Circle No. 154 on Reader Service Card

Lever Hoist

Product: 3/4-ton lever hoist using only 1/3 arc movement for operation.



Manufacturer: Thern Machine Co., Winona, Minn.

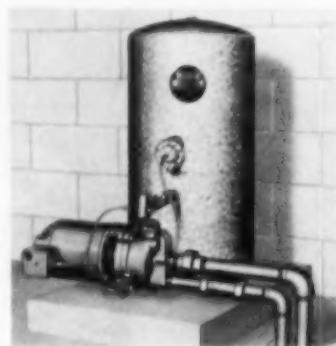
Features: Designed for angular, horizontal, or vertical lifting. Special-type ratchet, with two ratchet levers in constant contact with ratchet wheel, keeps wheel under control and guards against slipping. Chain provides perfect flexibility for more pulling or lifting jobs. Components are aluminum alloy combined with brass-plated, steel-alloy chain which

is electrically welded. Top and bottom hooks swivel for easy turning of load being moved. Standard chain length is 64".

Circle No. 155 on Reader Service Card

Jet-Type Water System

Product: Jet-type water system ("HK Ejecto").



Manufacturer: F. E. Myers & Bro. Co., Ashland, Ohio.

Features: Available in 1/3 and 1/2 hp and as shallow or deep well unit. Available as water system with 42, 21, 11, or 4-gal. pressure tank. Capacities as high as 800 gph. Design helps make priming faster. Entire pump dismantled in five minutes. All parts are within easy access for inspection. No lubrication required. Deep well model installed vertically as well as horizontally.

Circle No. 156 on Reader Service Card

Cable Hoist

Product: Hoist for operation by one man.

Manufacturer: Saf-T-Lift Co., Peoria, Ill.

Features: Designed specifically to allow one man to lift piece of equipment up to 16' long and weighing up to ton to height of 10' from



ground level and roll it from one place to another. Cable arrangement renders hoist completely safe to use in that the heavier the equipment and the higher it is lifted, the tighter it is gripped. Width is 18", height 22". Frame is made of 1" tubular steel. Light enough to carry. Equipped with 25 feet of airplane cable with loading capacity of 4700 lbs.

Circle No. 157 on Reader Service Card

Reach-In Wall Case

Product: Model EWS-40 reach-in wall case.

Manufacturer: Evans Mfg. Corp., Mt. Vernon, N. Y.

Features: Self-contained and ready to plug in. Free-sliding glass doors allow vision to be drawn into case. Massive heavy-duty wire shelves permit maximum display. Measures 54" long, 74" high, and 30" deep. Self-defrosting blower for uniform temperature.

Circle No. 158 on Reader Service Card

Concrete Fastener Kit

Product: "Kwikit", self-drilling concrete fastener.



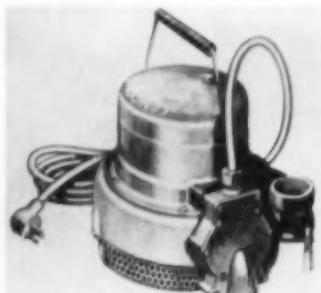
Manufacturer: Phillips Drill Co., Michigan City, Ind.

Features: Outfit contains 12-1/4" and 6-3/8" fasteners, plus combination holder and setting tool. Packaged in metal, flip-top box that can be carried in hip pocket. Each fastener acts as drill and bores its own hole. No extra drills or explosive charges are needed and every hole is exact size needed for particular fastener. Installed quickly with motor impact hammer. Fasteners will support from 1 1/2 tons to more than 7 tons each, depending on size used.

Circle No. 159 on Reader Service Card

Submersible Pump

Product: Model 140, 3000 gph submersible multi-purpose pump.



Manufacturer: Kenco Pump Div., American Crucible Products Co., Lorain, Ohio.

Features: Built-in check valve,



He knows why it pays to use ANACONDA

Anaconda Tubes, Fittings, Vibration Eliminators are engineered and built to work together for quick installations, for quality jobs that bring in new business... Anaconda's full line means easy one-stop shopping, too!

See your Anaconda Distributor

The American Brass Company, Waterbury 20, Conn.
In Canada, Anaconda American Brass Ltd.,
New Toronto, Ontario.

ANACONDA
REFRIGERATION PRODUCTS

& AIR CONDITIONING • NOVEMBER, 1956
Circle No. 49 on Reader Service Card

air lock eliminator, and thermoplastic cord and cap. Circulates liquids in closed systems such as cooling evaporative condenser coils. Built-in check valve reduces installation time and prevents water from running back into pit after pump stops, manufacturer says. Air-bleed valve allows rising water to expel air, but closes instantly when pump starts. Guaranteed starting. Weighs 25 lbs. Only 7½" high, 10" wide. Capacities (gph) at different heads: 2600, 5'; 2000, 10'; and 1100, 15'.

Circle No. 160 on Reader Service Card

**BUY FROM YOUR
REFRIGERATION WHOLESALER**

STOP SERVICE WORRIES...

with

Proven KMP

MOISTURE MAGNET

THE ORIGINAL EQUIPMENT DRYER USED BY OVER 75% OF THE WORLD'S LEADING REFRIGERATION AND AIR-CONDITIONING MANUFACTURERS

KMP

**KENMORE MACHINE PRODUCTS, INC.
LYONS, NEW YORK**

Dryers • Accumulators • Accumulator Dryers • Strainers • Capillary Assemblies

KMP MOISTURE MAGNETS ARE BETTER... COST LESS

Circle No. 50 on Reader Service Card

Time Switch

Product: Seven new models of automatic time switches.

Manufacturer: International Register Co., Chicago, Ill.

Features: Models offer control of electrical circuits from periods of two seconds to 24 hours. Series T960, for one to 96 on-off operations every day. V21000 Series, a seven-day time switch, used for controlling heating and air conditioning systems. V22000 is two-circuit switch. V27000 is accurate unit for controlling operations of five or 15-minute intervals during 24-hour period. V28000 or V29000, program timers, control one to 288 daily operations of bells, etc., for

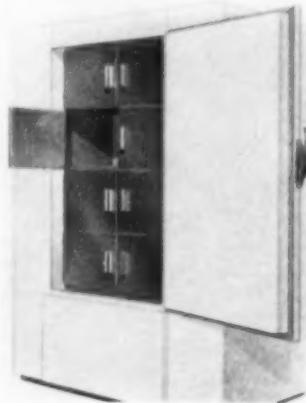
two-to-60-second periods. C8300 Series is 12-minute cycle repeater timer. Models include easy-to-set dial and trippers, heavy-duty, industrial-type motor, full guarantee, and convenient knockouts. Housed in steel cases. Equipped with hasp for sealing or padlocking.

Circle No. 161 on Reader Service Card

Upright Freezer

Product: Line of upright freezers available in six models.

Manufacturer: Nor-Lake, Inc., Hudson, Wis.



Features: Cooling coil for each shelf and double-type inner doors. Hinged doors prevent loss of cold air when main door is opened. Has 3½" wall of Fiberglas insulation. Quick freezing and easy cleaning are made possible by stucco-finish aluminum interiors. Placement of copper coils insures fact that no spot is over 5" from coil. Heater strip around door opening prevents sweating. Capacities of 17, 20, and 27 cu.ft.

Circle No. 162 on Reader Service Card

Paste-Form Solder

Product: "Swif" 95, a 95/5 tin-antimony solder combined with active flux in paste form that is designed for heating and air conditioning applications.

Manufacturer: Hercules Chemical Co., New York, N. Y.

Features: Used where higher temperatures and pressures prevent utilization of regular solder. Should be used for sweat connections on lines carrying temperatures up to 250 F, for pressures up to 500 lbs., and for saturated steam up to 80 lbs. Flows at 468 F. Brushed on tube and fittings and then heated with torch, for sweat connections. Available in 4 oz., ½ lb., and 3 lb. containers, with free brush.

Circle No. 163 on Reader Service Card

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CONNECTION
YOU CAN MAKE!....**

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REFRIGERATION TUBE AND
SOLDER-JOINT FITTINGS**

Easy and so perfect...every job goes that way when you use Chase copper refrigeration tube and solder-joint fittings! Inside and outside diameters are made to close tolerance. You join and solder them in seconds. They expand and contract as one rugged unit for flawless service. No shoulders or rough interiors mean refrigerant flow is sure to be smooth and rapid.

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& AIR CONDITIONING • NOVEMBER, 1956

**Here's your key to
MORE BUSINESS . . .**

famous
Janitrol
**gas-fired
DUCT FURNACES**

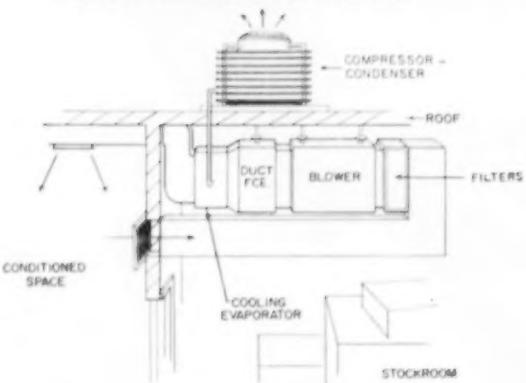
**... help you sell
heating-cooling
combination systems by
keeping costs down!**

Pull out *all* the stops on competition when you go after heating-cooling combination jobs. Figure the system with Janitrol Gas-fired Duct Furnaces, and you'll be a tough competitor. Janitrol Duct Furnaces are low in cost, require less installation time and labor. They fit right into duct work used for cooling, save space, assure highest heating efficiency. As for durability, let this fact be your guide: Janitrol's exclusive armor-coated, corrosion-resistant heat exchanger is so rugged that replacements for any cause during the past seven years have run less than $\frac{1}{4}$ of 1%! That's proof of real quality!

Janitrol Duct Furnaces are easily added to existing cooling systems, too—with BIG savings. Another source of profitable new business for you. Write us today for Bulletin DF-5, giving complete specifications and performance data on the six sizes of Janitrol Duct Furnaces. Address Department CR-611.

SIX gas fired models—capacities 85,000 to 450,000 Btu/hr.

TYPICAL COMBINATION SYSTEM



NOTE: All DUCT Furnaces should be installed in accordance with the procedures established by AGA and ASA.

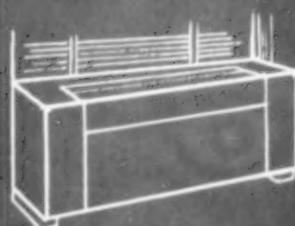
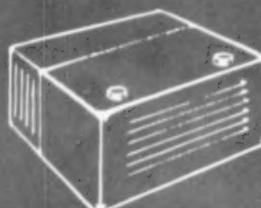
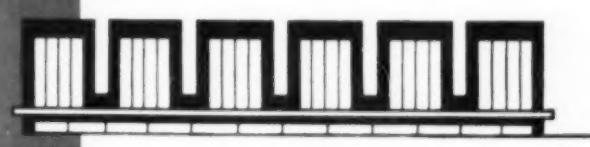
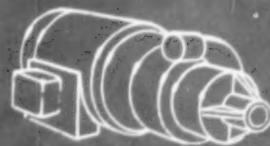
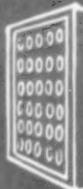
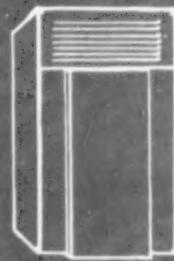
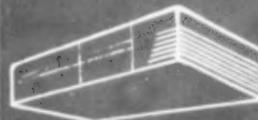
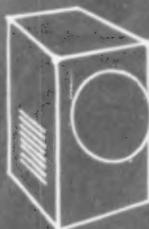
Janitrol
HEATING AND AIR-CONDITIONING
DIVISION

Surface Combustion Corporation, Columbus 16, Ohio
In Canada: Moffats, Ltd., Toronto 15

Circle No. 51 on Reader Service Card

Air Conditioning Section

COOLING • HEATING • CIRCULATION AND HUMIDITY CONTROL



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BIG NEWS

from Typhoon—

On How To Make Money This Fall!



No post-season slump for Typhoon dealers. We're going all out on a special Fall Promotion Program to bring them business when they need it most!

◀ This comprehensive folder, filled with top-notch aids and dividend features—newspaper mats, a bang-up direct mail campaign, and a host of other hit-ideas—will increase pre-season sales and profits. No need for your profits to fall this Fall if you tie in with Typhoon's special sales-building program.

10 GOOD REASONS

**why a Typhoon Franchise is your Best
All-Year-Round Security, too!**

1. 100% advertising credit—to give you frequent sales getting newspaper advertising at the local level.
2. Aggressive and field tested fall promotion program.
3. Deferred payment plan—keeps business going strong all-year-round by offering your customers Fall and Winter installations with payments starting in May.
4. Field warehousing plan—a pay-as-you-use plan on complete inventory set up in your own warehouse.
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6. Re-purchase agreement—enables you to carry more stock and sell more by increasing your present line of bank credit.
7. Close factory cooperation—you deal direct with everyone, from the Typhoon president down.
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9. Regional schools—offering free sales-engineering courses.
10. Top-quality units—the largest range of waterless air-cooled equipment including 8 and 10 ton capacities. All are superbly engineered, competitively priced and built with finest components for trouble-free operation.



2-3-5-8-10-15-20-25-30-40 TONS

Write, phone or wire today
for information about a Typhoon franchise
in your territory...and the special Fall
Promotion Program to bring you
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Specialists in Human Comfort Since 1909
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Circle No. 52 on Reader Service Card

NOVEMBER, 1956 • COMMERCIAL REFRIGERATION



Even though it's "just a package unit",
it's still of prime importance to

PLAN before you INSTALL

by A. J. Hackl

Manager, Packaged Equipment Dept.
The Trane Co.

PROGRESSIVE businesses throughout the country are rapidly becoming aware of the commercial advantages of air conditioning. Shops, offices, supermarkets, beauty parlors, restaurants and clinics are all cashing in on the increased employee efficiency and customer comfort provided by compact self-contained air conditioners. Last year approximately \$100 million worth of these units were sold. In 1960, it is estimated that sales will amount to \$160 million.

The self-contained air conditioner is, as its name implies, usually a complete factory-assembled system. It is only necessary to make water and electrical connections to provide a complete comfort cooling system. The addition of a heating coil and related equipment will provide for a complete summer and winter air conditioning system within the limits of the unit's size range.

The first step in the design of any air conditioning system is to carefully survey the space to be conditioned and calculate heating and cooling requirements.

To aid in calculating cooling requirements, there are a number of available forms. One of the most highly recommended is the standard Air-Conditioning and Refrigeration Institute cooling load estimate form for applications not requiring a guarantee of specific conditions of temperature and humidity.

The survey of the space should include complete measurement of the area to be conditioned, taking into

Here is a summary of the principal factors which should be considered in the application of self-contained air conditioning equipment to various types of locations.

consideration glass areas, doors, and locations of other heat gain sources. Exposure, number of people, lights and other items indicated on the survey form should be noted. The units should be selected to offset the total load determined from the estimate form calculation.

Proper ventilation is vital to any good air conditioning installation. Some local ordinances require minimum ventilation amounts in a given area. The accompanying table can be used as a guide for determining nominal amounts of air required for various applications.

Ventilation air should be introduced through the unit to assure proper treatment. The load imposed by ventilation air will add to the unit requirement as determined by the load calculation form.

Infiltration of outside air through building cracks and openings has the same effect on the conditioning load. Normally, calculations should be made for infiltration and outdoor air requirements, utilizing the larger of the two, but not the total.

In no case should less ventilation air be used than

any amount that may be drawn from the space by exhaust fans. For instance, if the space to be air conditioned has an exhaust fan that draws 500 cfm from the area, then at least 500 cfm of ventilation air must be introduced through the self-contained unit.

Outside air intakes should be equipped with a damper to provide volume balancing and positive shut-off. The intake should be located to provide a source of clean outside air, avoiding proximity of exhausts, vents or street exposures.

Job Requirements Should Be Surveyed

Unit locations should be determined from survey and job requirements. Present day self-contained units are becoming increasingly more compact and efficient. Some newer units now occupy less than six square feet of floor space.

It is desirable to leave approximately 36" clearance on all sides of the unit for complete access. Although this is not always possible, allowance of 24" clearance in front of the unit is required to provide minimum service accessibility.

In locating the unit, consideration should be given to the available electrical power source, water for condensing, and drainage facilities in order to provide these services conveniently and at a minimum expense.

The size and shape of the space to be conditioned will determine the type of distribution system required.

For areas with no obstructions or partitions, units installed within the area with standard discharge plenums will provide the most economical installation. These plenums are furnished with outlet grilles having adjustable louvers providing both vertical and horizontal deflection. Discharge is normally through the front of the plenum, but end discharge is also available.

Duct Work Can Be Used Advantageously

A system of duct work should be designed for applications involving partitioned areas, excessive runs or other problems that cannot be handled with plenum chamber discharge. Larger tonnage best handled by a single machine should also be designed with a system of duct work. The system should be designed as simply as possible.

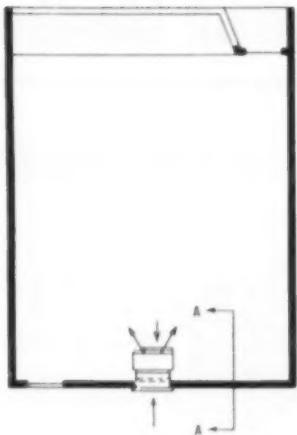
Various methods for sizing the duct system are available, as are a variety of mechanical devices for calculating sizes of ducts and determining velocity recommendations for various applications.

In the case of units equipped with internal wiring,

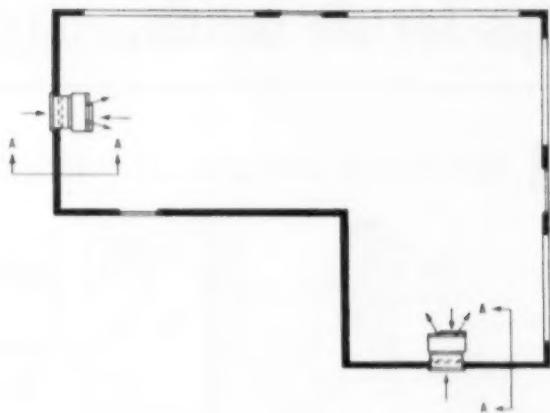
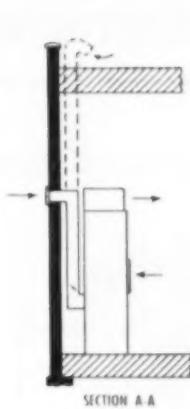
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Outdoor Air Required for Ventilation

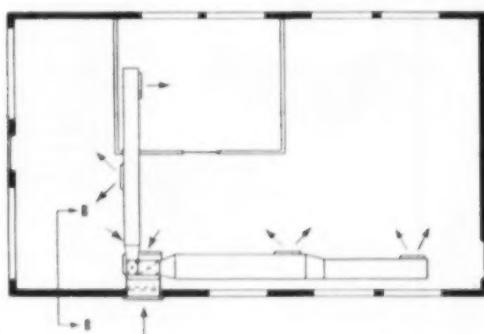
OCCUPANCY	CFM PER PERSON
Spaces in which there is no smoking	
AUDITORIUMS	
CHURCHES	5 to 7.5
THEATERS	
Spaces in which there is moderate smoking	
BARBER SHOPS	
BEAUTY PARLORS	
FUNERAL PARLORS	7.5 to 10
OPEN SPACES IN BANKS	
RETAIL SHOPS	
APARTMENTS	
DRUG STORES WITH LUNCH COUNTERS	
HOSPITAL ROOMS	10 to 15
HOTEL ROOMS	
OPEN SPACES IN GENERAL OFFICES	
RESTAURANTS, PUBLIC DINING ROOMS	
Spaces in which there is heavy smoking	
BROKER'S BOARD ROOMS	
DIRECTORS' ROOMS	
NIGHT CLUBS	20 to 30
PRIVATE OFFICES	
TAVERNS AND COCKTAIL BARS	



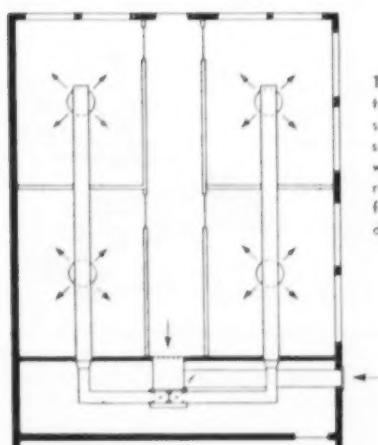
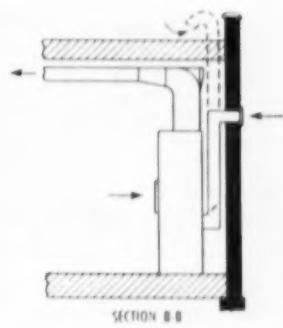
Typical single unit self-contained air conditioner application installed in an open conditioned area with plenum chamber discharge. Outside air may be drawn through either an inlet duct from rear wall or from roof, as shown in section A-A.



Typical multi-unit self-contained air conditioner installation with units installed in the open conditioned area and discharged from plenum chambers. Size and shape of space determines the number and location of units. Each unit is selected to offset the load for a portion of the area and distribution covered by length of throw limitations.



Typical unit self-contained air conditioner installation for existing office with exposed ductwork and sidewall grilles. Distribution to partitioned space and separated areas of the sort illustrated are best served by such arrangement of ductwork. Outside air intake through wall or roof as shown in Section B-B.



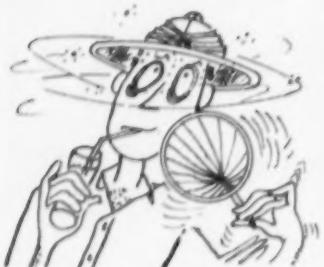
Typical single unit self-contained air conditioner application requiring ductwork for several partitioned office spaces. Hallway serves as a common air return passage with grilled or undercut doors permitting recirculated air to enter hallway. Use of false ceiling permits space for concealing ducts and use of ceiling-type diffusers if desired for more attractive installation.

Typical semi-recessed application of self-contained air conditioner with plenum discharge in conditioned area.

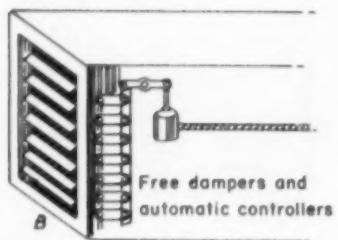
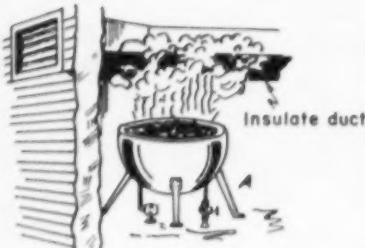


Tips for air conditioning servicemen on handling . . .

1 Not enough cooling..... Insulate ducts and check automatic dampers



Insufficient cooling in spaces when refrigerating system works right calls for a checkup outside in the machinery room. Don't overlook anything.



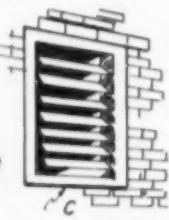
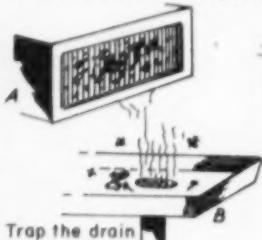
Ducts with no insulation often pass through hot areas (A). Quite often these areas are normally cool, but occasionally enough heat reaches ducts to transfer heat to conditioned air within. Standard duct lagging is good investment. Also look for automatic dampers being out of order (B). Oil moving parts and work by hand to free.

3 Odors are bad..... Clean dirt from inside ducts and check drains



Odors are disagreeable when carried with conditioned air. They make the operating engineer unpopular and defeat purpose of supplying treated air.

Remove mold from evaporator



Remove bugs and rodents from pans

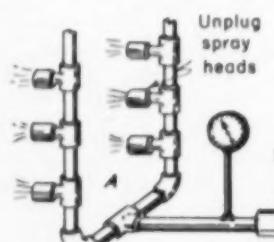
Trap the drain Reduce outside air

Mold or dirt accumulations on evaporator fins (A) spoil air passing through them. If drain lines are poorly trapped or water in gooseneck dries up (B) sewer odors escape. Outside air improperly dampered (C) mixes with inside air, contaminating air supply. Look out for foreign matter such as insects and dead mice in drain pans (D). Keep these clean.

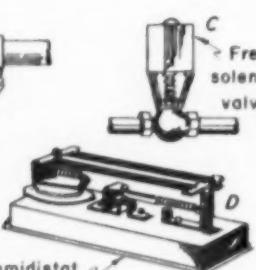
5 Low humidity.....Inspect spray nozzles, strainer and solenoid valve



Low humidity is uncomfortable; it dries mucous membranes, causes headaches. Modern systems control humidity, keeping air's moisture right.



Speed up pump



Correct faulty humidistat

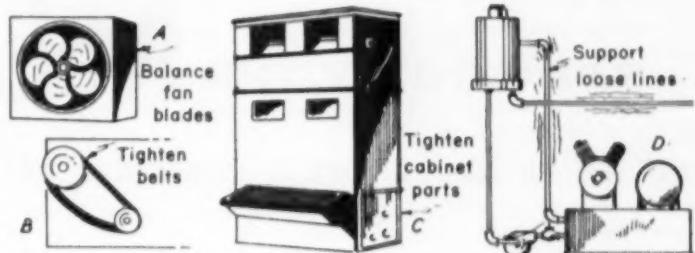
Spray heads get plugged (A) or water pressure at nozzles is low or even shut off. Gauge may not show right reading. Strainer (B) might be plugged. Check solenoid water-control valve (C). It might be sticking or burned out. Inspect humidistat (D). Sensitive element is delicate; if insulated with dust it will show faulty reading.

..... 6 COMMON CUSTOMER COMPLAINTS

2 Mechanical noises Tighten cabinets and fan belts, support piping



Mechanical noises in spaces are not only hard on nerves, but indicate that something is radically wrong with equipment. Get busy finding cause.

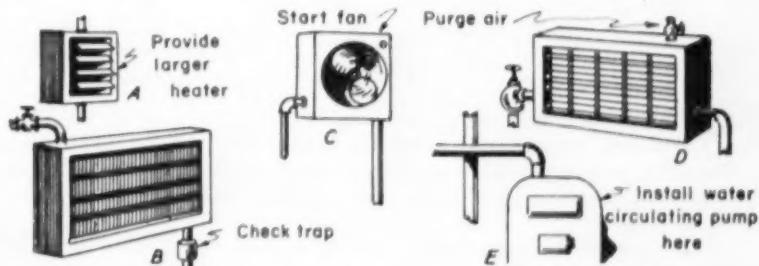


Fans get out of balance at times (A). Shut down and check. Rebalance in workshop. Fan belts slip (B) sending irritating noises through ducts. Belts are easy to tighten. Loose cabinet parts vibrate (C). It is good practice to tighten all screws at set periods. Pipes to refrigerating compressor vibrate (D). Bracket pipes right.

4 Not enough heat Vent heating coils, check traps, buy circulator

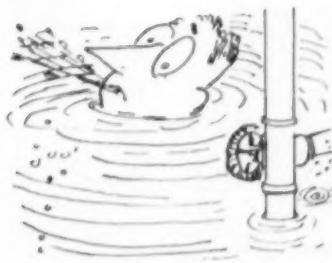


Low temperature from insufficient heat calls for action. Discomfort is hard to endure and doesn't help production or operator's reputation.

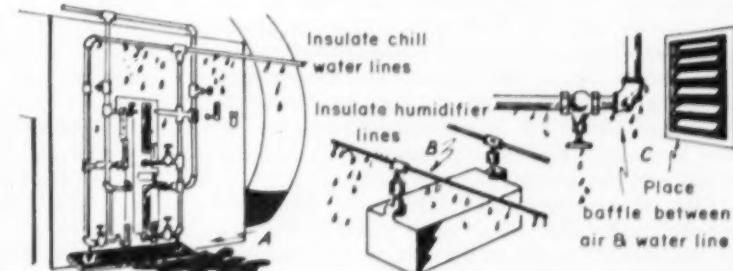


Heater (A) may be too small for job or not located right. Drain lines from heater (B) are trapped improperly or trap doesn't work. Often, fan (C) isn't running or no one checked it before complaining. Hot water coils (D) get air bound. Open vent before looking further. Circulating pump is needed in line (E) or piping is poorly arranged.

6 Flooded floors... Baffle and insulate chill water piping from the air



Water on floor is not only messy but creates expensive problem by soaking into floor, shorting electric equipment and even causing accidents.



Chill water coils leading into conditioned equipment (A) should be insulated to prevent condensation. Humidifier piping in cold fresh-air current (B) should be insulated from air. Water supply line (C) is in cold air stream or valve packing leaks. Drip pans are usually a nuisance. Insulate all lines and correct all leaks.

**WE SELL OUR
SERVICE BY THE**

MONTH

and we've never lost a customer yet!



That's the proud boast of this contractor who uses
low monthly payments as bait in merchandising maintenance contracts

SELLING air conditioning service on a monthly basis has enabled the Adkins-Latta Co., Bryn Mawr, Pa., to merchandise its service contracts to more residential, commercial and industrial customers than ever before.

"Many customers are reluctant to buy a service policy for their air conditioning units because they feel that the cost of such policies is not warranted," explains president Thomas H. Latta. "They figure that an early spring inspection, and service when it is needed, will cost less than the full price of a service contract. So rather than have to pay a heavy policy charge, they will wait until they have need of service."

The Adkins-Latta Co. has been promoting service policies on a low monthly payment plan for the past two seasons with very great success. This has proven particularly appealing to small businessmen and institutions who find the monthly payment plan more to their liking than a three-figure bill once a year. During the past season alone, this firm has added more than 60 new customers to its service accounts through the stimulus of this monthly payment plan.

"We do not have a flat charge for all service policies," says Latta. "Each one is priced individually on the basis of the size of the unit, its age, and other factors. But in all cases, each unit is given an annual inspection and service when needed. Our policies do not cover parts; only service. This helps to hold down the over-all cost of the policy and is more to the liking of our customers."

The "labor only" service policy has great appeal because customers feel that labor is the most costly part

of air conditioning service. Adkins-Latta like it also because the customers pay for any replacement parts they need at the prevailing market price. For many customers, the problem of getting a serviceman on the job promptly when needed is their principal concern.

A personal inspection of the air conditioning equipment to be covered is made prior to the issuance of every service policy. At that time the monthly charge system is outlined to the customer. If the customer prefers, however, he can be billed on an annual basis. This is usually what happens with contracts covering window units, for the cost of such policies runs around \$25 or \$30 a year, and many owners of such units don't want to be bothered by small monthly bills for this service.

"Prices of our service contracts start at \$25 for a window unit and run into the hundreds of dollars, dependent upon the amount of equipment in use," Latta reports. "For example, we bill many local institutions at rates varying from \$10 to \$70 a month. In a nearby shopping center, we handle all service on 70 tons of air conditioning equipment at a monthly charge of \$74. The management of this center likes our monthly billing at it doesn't put a heavy annual drain on their finances. Hospitals, colleges and smaller business people like it too."

Many customers who discontinued their service policies prior to the inauguration of the monthly payment plan have since returned to the company. Many businessmen are reluctant to pay for a year's service policy in advance because they feel that this money can be put to better use in their own business. Small month-

ly payments, on the other hand, don't present that problem.

Also, some customers don't renew annual service policies because they intend to move or sell their business. But when told that they can pay by the month and discontinue their policies at any time, they almost always are willing to retain their service contracts on this basis.

"In the last two years we have had a 100% policy renewal," explains Latta. "We just keep billing our customers on a continuous basis every month, but at the beginning of each new season we notify them that their service policy charges will be somewhat increased because the equipment is a year older."

"We have yet to have a complaint from a customer about the few dollars difference that this increase makes on the monthly bill. If we billed annually, on the other hand, the sum would really amount to a substantial increase dollar-wise. That is the reason why many customers used to discontinue their service policies."

A monthly statement is rendered all customers. A reminder notice is sent out several days later if no payment is received, but with this goes a message about the importance of getting service when it is needed. A telephone call acts as a third reminder and this is usually made by the service manager.

The service manager tells the account that he is the one charged with the responsibility of keeping the customer's air conditioning system in good operating condition and the only way he can continue his duties is by getting the O. K. from the Adkins-Latta office. So

if the customer will only make his payment, the service manager explains, he will be ready for 24-hour service at any time.

"Delinquent accounts are few and far between," says Latta. "Usually it's an oversight on the customer's part, for once the customer gets into the habit of paying his monthly service charge it becomes almost automatic."

A card is maintained for every service policy issued. This bears the name and address of the customer and the type of equipment, along with other pertinent information and monthly charges. On a predetermined date each month, the statement is rendered the customer and an appropriate entry is made on the card. The date payment is received also is noted.

All follow-up notices are recorded, too, so that each card becomes a running record of the account. All monthly payments are scheduled to be made in advance, but are allowed to run for 15 or 20 days past due before the policy is cancelled for non-payment.

"One of the best ways of getting a cancelled customer back on our books is to have our service manager call on him," Latta declares. "There just seems to be something psychologically effective about having a uni-

Continued on page 91



PROMOTING SERVICE after the sale to a window air conditioner customer, Thomas Latta explains that changing the filter is only one of the important services rendered under every maintenance contract. First page of the three-sheet contract form is reproduced at right.

24-Hour Service

Phone: Bryn Mawr 3460

AIR CONDITIONING SERVICE CONTRACT

Purchaser: _____
Address: _____

Date of Contract: _____
Expiration date: _____
Amount of Contract: \$ _____
Terms: _____

In consideration of the payment of \$ _____ to be made to the seller by the Purchaser at the time this contract is executed, the seller agrees to render the service hereinafter described for a period of twelve (12) months beginning _____ on _____ and continuing as follows:

Description of equipment: _____

Location of equipment: _____

THE SELLER AGREES:

1. To make a thorough inspection approximately. For the purpose of such inspection, authorized representatives of Seller will be granted free access to the location of all air conditioning equipment at any time during business hours.
2. To make such mechanical adjustments and repairs to air conditioning equipment, which in its judgment are necessary for proper operation of the equipment, including labor, at each regular inspection. Any materials needed are to be paid for by the Purchaser.
3. To make such mechanical adjustments and repairs to air conditioning equipment, which it may consider advisable before next regular inspection. Any materials needed are to be paid for by the Purchaser.

KNOW YOUR ELECTRICAL TEST INSTRUMENTS

**They can help you do a better job of servicing
mechanical as well as electrical equipment**

by Edward Dowis

AIR conditioning service and trouble shooting requires a wide range of skills. This is because of the several conditions which must be automatically and simultaneously controlled, and the variety of mechanical, electrical, pneumatic and hydraulic equipment used in air conditioning systems.

The motive power for fans, compressors, pumps and much control equipment is usually electric, so consequently abnormal operating conditions and mechanical defects often can be detected electrically. Changes in temperature and humidity cause changes in resistance values which can be measured with electrical instruments.

The commonly used electrical instruments include:

- (1) **VOLTMETERS** — For measuring electrical pressure or voltage at any desired point.
- (2) **AMMETERS** — For measuring current intensity or rate of flow. It is measured in amperes.
- (3) **WATTMETERS** — For measuring total power passing through any circuit, expressed in watts or kilowatts.
- (4) **OHMMETERS** — For measuring resistance to electric current flow. This is expressed in ohms.

The basic element in any of these instruments is usually a sensitive meter which will respond to very

minute changes in electric current or voltage. Some of these will respond to changes of a thousandth or millionth of a volt or ampere and are called milli or micro ammeters or voltmeters. With suitable resistances and switching arrangements, a single instrument may be used as a voltmeter, ammeter, ohmmeter and wattmeter. Combination voltmeter, ammeter and ohmmeter instruments, as well as voltmeter, ammeter and wattmeter, are quite common.

There are several types of electric meters, each of which operates on a fairly simple principle. The more commonly used ones are illustrated in Fig. 1.

The permanent magnet type has a magnet so mounted that any movement will be indicated by the pointer. The magnet is influenced by a coil carrying the operating current. Magnetic effect of the current causes the magnet to be deflected, thus moving the pointer. This type of instrument will operate only on direct current but a simple rectifier can be added to make it adaptable to alternating current.

The two-coil instrument uses the magnetic effect of two coils, one stationary and the other fastened to the pointer. This type is adaptable to d.c. or a.c. and is the only type which can be used as a wattmeter. This is because one coil can carry current being used,

while the other is connected across the voltage being impressed. Fig. 2 shows such an instrument connected to measure watts.

The hot wire ammeter utilizes the heating effect of electric current to change the length of a wire and transmit the variation to the pointer.

An electrostatic voltmeter may be used for high voltages. It depends upon the attractive force of unlike charges of electricity upon two plates, one of which is fastened to the pointer. It has an advantage of requiring practically no operating current.

The amount of current which flows in any d.c. or non-inductive a.c. circuit is dependent upon two factors alone: (1) The voltage impressed; (2) The resistance of the circuit.

Volts, amperes and ohms are directly proportional, and if two are known the other can be found by these simple formulae:

$$\text{Volts} = \text{amperes} \times \text{resistance}$$

$$\text{Amperes} = \text{volts} \div \text{ohms}$$

$$\text{Ohms} = \text{volts} \div \text{amperes}$$

Fig. 3 shows a simple arrangement of resistances with a meter to permit reading either volts or amperes. A high resistance (R_1) is connected in series with the voltage terminals and meter. Since current through the meter is proportional to voltage across the resistance, the meter can be calibrated to read voltage direct. With suitable resistance, any desired number of voltage ranges may be read.

To read amperes, a low resistance (R_2) is connected parallel with the meter. The line carrying current to be measured is connected in series with this resistance. The meter will then indicate voltage across the resistance, but since this voltage is proportional to amperage the meter can be calibrated to read amperes direct. Suitable combinations of resistors and switching arrangements can make a single instrument usable for reading any combination of volt or ampere ranges.

Use of the Voltmeter

The most common use of a voltmeter is to determine if motors are receiving proper voltage. The meter is connected directly across motor terminals. The reading should be noted as the motor is started and also after it has come up to speed, since line voltage drop will be more during the starting period. By comparing voltage readings at the entrance switch and at motor terminals, total line drop can be determined.

A simple way to determine line voltage drop due to motor operation alone is to connect the voltmeter across the line ahead of the switch and note readings before and during the starting period.

A voltmeter consumes a very small amount of current while in use. Some are not designed to withstand their rated voltage continuously. For these reasons, a push button switch may have to be depressed to get a reading. This switch is connected in series with the instrument coil. Fig. 4 shows the connections for both a voltmeter and ammeter.

Continued on page 78

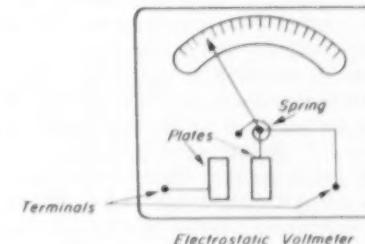
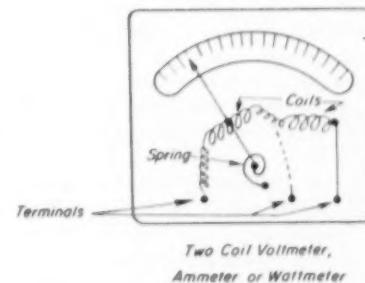
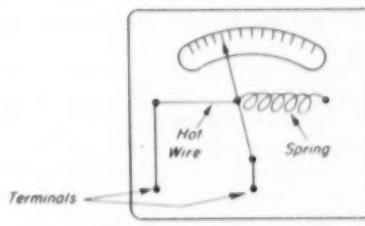
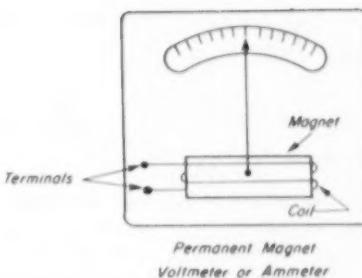


FIG I—Four Common Types of Meters

ELECTRICAL TEST INSTRUMENTS

Continued from page 77

Use of the Ammeter

The ammeter measures the intensity of current passing through a line. A fuse may be inserted in series with the instrument, as shown in Fig. 4, if there is a possibility that line current may exceed the capacity of the meter. A switch connected in parallel, as shown, will permit current to bypass the meter until a reading is to be taken. This may also protect the meter against prolonged overloads.

A very convenient instrument for service work is a split-tong ammeter, which makes it possible to read amperes in a line without disturbing any connections. The tongs of this instrument are simply slipped around the wire carrying current to be measured. Inductive effect of the current actuates the meter. Tong ammeters are available for any scale range desired. They are moderate in price and some have leads which can be connected as on any voltmeter for the purpose of reading voltage.

The most common use of the ammeter is to determine if motors are operating properly. Since changes in load cause changes in operating current, many mechanical conditions, as well as electrical, can be detected with an ammeter.

A higher reading than the motor nameplate indicates may be due to any condition which may overload the motor. When testing compressor motors, such conditions include:

- (1) Insufficient condensing water or temperature too high;
- (2) overcharge of refrigerant;
- (3) undissolved gas (usually air) in the system;
- (4) poor air circulation over air cooled condensers;
- (5) improper functioning of evaporative condensers or cooling towers;
- (6) improper functioning of expansion valves.

A fluctuating pointer in an ammeter testing a compressor motor may indicate a leaking valve if there is one fluctuation for each compressor revolution. This is more easily detected on a slow speed, belt driven compressor than on the sealed types.

Disturbances in the air flow system are often indicated by abnormal ampere readings in lines to fan motors. Obstructions such as clogged filters reduce the load on motors driving centrifugal fans and consequently the amperage they draw. Periodic ampere readings can be used to determine when filters need cleaning or replacing. Any noticeable reduction in amperage indicates such changes are due.

Increase in amperes required by centrifugal fan motors indicates reduced resistance in the air flow circuit. This may be due to filters being left out of holders, openings made in ducts during repairs or alterations, or changed damper settings.

To determine normal amperes for a motor, readings should be taken when the system is operating properly.

Motors are sometimes selected with reserve capacity and may not require the full nameplate amperage even though operating properly. Any motor drawing more than the nameplate ampere rating for more than a brief period is in danger of overheating and burning out.

When fuses or overcurrent protectors in the circuit repeatedly stop a motor, the ammeter can determine if the trouble is in the protecting device or in the motor or load. If ampere readings do not exceed the rating of the motor, ambient temperature around the protector is too high, the wrong protector is being used, or it is defective. If the motor is stopped while drawing excessive current, the protective device is performing its duty.

Use of the Wattmeter

The wattmeter measures total power input to a motor or circuit. 746 watts is equivalent to one horsepower. In d.c. and non-inductive a.c. circuits, watts can be found by multiplying volts times amperes, so a wattmeter is not necessary.

Since all a.c. motors are inductive, the voltmeter and ammeter do not indicate true power and a wattmeter is necessary. This is because the cycles of voltage and amperage are out of step. Fig. 5 shows the connections and characteristic readings of a voltmeter and wattmeter connected to a 2-hp motor.

Line voltage is 230. A 2-hp motor, fully loaded, will draw about 9.5 amperes. The volt-amperes (volts x amperes) are 2185. The actual watts, as read by the wattmeter, are 1857. The ratio of true watts to volt-amperes is called power factor and is expressed as percentage. In this case it is $1857 \div 2188$, or 85%.

Motors operating at high power factor require less current than those of the same horsepower at low power factor. Fully loaded motors operate at higher factor than partially loaded ones. Design also affects power factor.

Many room air conditioners are designed for high power factor so as to draw minimum amperage. It is amperage which determines minimum wire size for feeders and voltage drop for a particular line. Power factor performance can be checked with a voltmeter, ammeter, and wattmeter.

Efficiency of a motor is the ratio of power output to input, expressed in percentage. In Fig. 5, the input is 1857 watts. If the actual output is 2-hp, the wattage equivalent is 2×746 , or 1492. Efficiency is therefore $1492 \div 1857$, or 80+%.

Use of the Ohmmeter

The condition of electrical equipment, including motor windings and wiring, is usually determined with the aid of some form of resistance or ohmmeter. There are many types of these instruments. The most convenient ones contain a battery or generator to supply the voltage required for the test. This is combined with various resistors and a sensitive meter calibrated to read ohms directly.

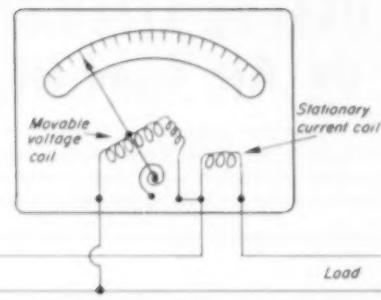


FIG. 2 - Two Coil Meter Used as Wattmeter

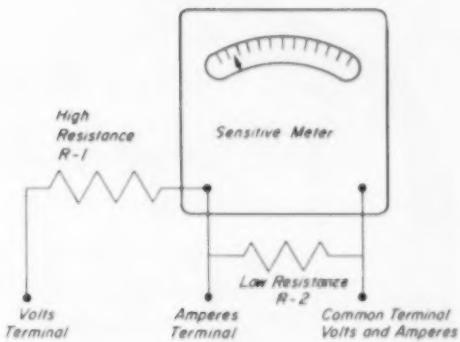


FIG. 3 - Combination Voltmeter - Ammeter Connections

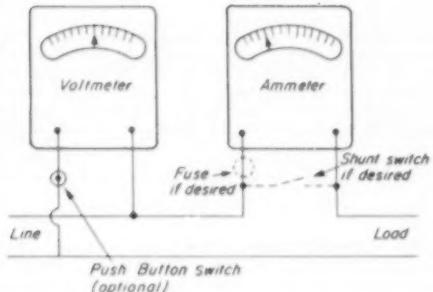


FIG. 4 - Voltmeter and Ammeter Connections

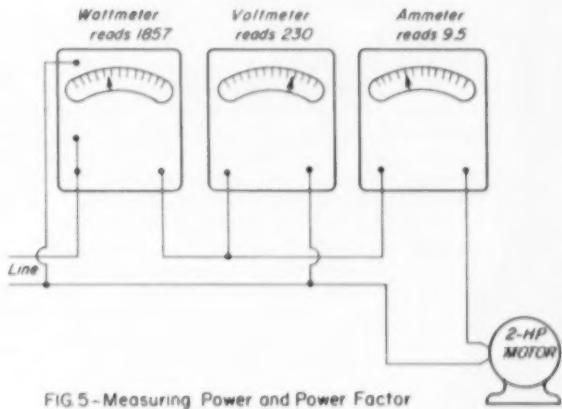


FIG. 5 - Measuring Power and Power Factor

Original resistance of motor windings is obtainable from manufacturers. Damage to wire insulation reduces winding resistance. Temperature is a factor in resistance, and comparative readings should be made at a specified temperature. The ohmmeter is often used as a continuity tester and will tell not only whether a circuit is closed but also the resistance. Solenoid valve coils and coils in motor starters and control systems can be tested with an ohmmeter.

Determination of starting, running, and common terminals of hermetic motor-compressors is simplified with an ohmmeter. Highest resistance reading will be between starting and running. Lowest will be between common and running. The intermediate reading will be between common and starting.

For testing insulation between motor windings and wiring and motor and machine frames, a megohmmeter, measuring in millions of ohms with relatively high voltage, is most useful. This test is of greatest value when made periodically at inspection periods. Reduction of resistance between winding and frame may indicate presence of moisture or other conditions

which then can be corrected before complete breakdown occurs.

It is worth noting that resistance can be measured with a voltmeter and ammeter and source of direct current. The instruments are connected as in Fig. 4. Resistance will be volts \div amperes. If a.c. is used, total impedance, which includes resistance and reactance, will be the result obtained.

The capacity of a motor starting or running capacitor can be found by connecting the capacitor where load is indicated in Fig. 4. A fuse definitely should be used to protect the ammeter in case of a capacitor short circuit. For a starting capacitor, the current should be connected only long enough to obtain readings, or the capacitor will be destroyed. The following formula applies only for 60 cycle a.c.

$$\text{Capacity in Mfd.} = \frac{\text{Amp.} \times 2652}{\text{volts}}$$

To avoid shock, after capacitors have been tested, they should be discharged by connecting terminals together before they are touched.



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Circle No. 53 on Reader Service Card

USEFUL LITERATURE On Air Conditioning

To obtain the information described below, simply circle on the postcard in this issue the key numbers of the items you wish to receive. We will forward your requests to the companies concerned.

HELP TO PLANNERS AND INSTALLERS is provided by Drayer-Hanson in data information sheets on its complete line of air-cooled condensers. Graphic diagrams detailing typical wiring, multiple circuit, and outdoor installation are outlined. Table of dimensions, and performance curves, as well as selection problems worked out in step-by-step terms round out publication.

Circle No. 120 on Reader Service Card

UNIT CARTONED LINE of standardized pipe, duct, and fittings for residential heating and cooling installations is illustrated in three-color, 24 x 38" wall chart by Adelta Mfg. Co. Handy reference guide can be hung easily on walls or doors making it easier for contractors to determine their needs and sizes with all the necessary information being displayed in full view in one place.

Circle No. 121 on Reader Service Card

"ROOMAIRE" CONDITIONER STYLES are featured in four catalogs—7754 (FW), 7755-I (CFW), 7752 (CHW), and 7753 (HW)—prepared by Young Radiator Co. Contained are features, heating and cooling capacities, specifications and dimensional data clearly outlined in tables and drawings.

Circle No. 122 on Reader Service Card

OPERATION AND MAINTENANCE problems with boilers, oil burners, water supply systems, condensers, and air conditioning and cooling systems are described in 16-page booklet (PP-4) available from Perolin Co. Data on the company's full line of water conditioners and other chemical products is presented in this pocket-size publication.

Circle No. 123 on Reader Service Card

RESIDENTIAL APPLICATION of "Spotaire", air conditioning equipment by Drayer-Hanson, Div. of National-U.S. Radiator Corp., is the subject of a combination sales and engineering leaflet, the firm's first consumer literature piece made available for direct distribution to the public. Photos, diagrammatic sketches, and dimension-performance data charts describe the 13 standard models in the "Spotaire" HRC Series.

Circle No. 124 on Reader Service Card

MECHANICAL SPECIFICATIONS for all sub-assemblies and components in Type CC packaged water chillers for air conditioning or industrial cooling applications are listed in 16-page, two-color, illustrated Bulletin No. 5925 by American Blower Corp. Recommended selection procedure is presented with a selection-example included to demonstrate the procedure.

Circle No. 125 on Reader Service Card

OPERATIONAL PRINCIPLES of Chicago Blower Corp. hi-velocity power roof ventilator are explained in Bulletin CH-101. Discussed are the workings of the fan's automatic damper blades, high velocity exhaust capability, and fusible link fire safety device. Included are illustrations, performance ratings, and diagrams.

Circle No. 126 on Reader Service Card

TIPS ON INCREASING home "cool-ability", a check list for measuring cooling quality, and suggestions on financing are featured in 12-page brochure on residential central air conditioning available from Janitrol Heating and Air Conditioning Div. of Surface Combustion Corp. Concise booklet summarizes operation, selection, and installation of either air or water-cooled summer air conditioning.

Circle No. 127 on Reader Service Card

NEW-TYPE AIR FRESHENER, "Odo'Zone", is reviewed in pamphlet by Nanco Odor Control Co., which describes product's many uses and benefits. Economical features and important "don'ts" are supplied in this informative publication.

Circle No. 128 on Reader Service Card

CUSTOM-BUILT MODELS of packaged electronic air cleaners are discussed in eight-page catalog by Trion, Inc. Engineering data and size and capacity tables for fitting proper model to the job are included.

Circle No. 129 on Reader Service Card

UNIT AIR CONDITIONERS are promoted with clear photographs showing various applications in practical Frick Co., Bulletin No. 522-E, in color. Dimensional data and product illustrations also are supplied.

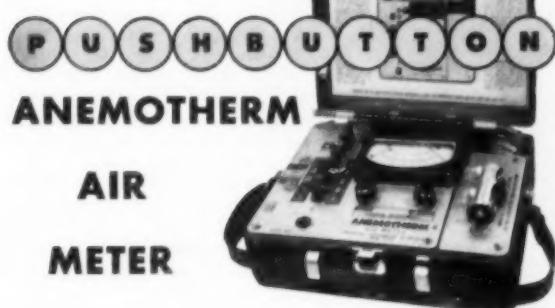
Circle No. 130 on Reader Service Card

DESIGN FEATURES of the AM-4 single-bearing motor and other descriptive data are presented in a four-page folder by Redmond Co., Inc. Drawings illustrate and help explain how "Tri-Flux" design adds third area of magnetic flux.

Circle No. 134 on Reader Service Card

(Turn to page 52 for more Useful Literature)

*How to balance air conditioning,
heating and ventilating systems
with the NEW*



Color-coded pushbuttons put air velocity, air temperature and static pressure at your fingertips in the new Model 60 Anemotherm Air Meter. Developed by the Anemostat Corporation of America, this versatile, accurate instrument helps you balance and check any air system. It pays for itself through time saved on only one major job.

• Write for Bulletin 55.

AC 1338A

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Circle No. 73 on Reader Service Card
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Circle No. 54 on Reader Service Card

WHAT'S NEW

In Air Conditioning Equipment

For further information on any of these products, simply circle on the postcard provided in this issue the key numbers of the items in which you are interested. Your request will be forwarded directly to the companies concerned.

(For more New Products turn to page 54)

Panel-Diffuser

Product: Modular ceiling panel diffuser (EP) extended into metal panel for use with "Acousti Line Pan" ceilings, and "Security Panel" ceilings.



Manufacturer: Anemostat Corp. of America, New York, N. Y.

Features: Can be used in "octopus" distribution system in which supply air is fed to attenuator chamber at high velocities, and distributed at low velocities through flexible metal tubes to as many as four ceiling diffusers. May be shifted easily without alterations of ductwork when requirements call for outlets to be relocated, added, or removed. Available in 12 x 24" or 12 x 48" panels.

Circle No. 171 on Reader Service Card

"Fashion" Thermostat

Product: "Fashion" thermostat designed to eliminate "mechanical look".



Manufacturer: White-Rodgers Co., St. Louis, Mo.

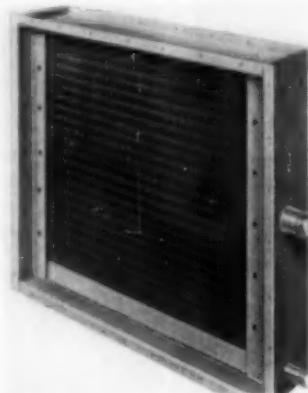
Features: Beige finish harmonizes with any color scheme, or can be painted to match color of walls.

Approximately 3" in width and height, and extends just fraction over 1" from wall. Inconspicuous mounting plate is available to replace old thermostats without leaving patch marks on wall. Controls gas valves, oil burner primary controls, relays, and stoker timers. Easy-to-read dial with large distinctive knob-indicator that affords quick, fingertip temperature settings, even in dark. Bimetal is of low-resistance type and of increased surface area to give greater sensitivity to room temperature changes. Pure silver contacts are protected from dirt and dust with plastic cover.

Circle No. 172 on Reader Service Card

Heavy-Duty Steam Coil

Product: Line of heavy-duty, distributor-type steam coils.



Manufacturer: Rempe Co., Chicago, Ill.

Features: Tilted design assures drainage of condensate, whether used for vertical or horizontal air flow. Cover pieces at header and stub ends are perforated to allow passage of measured amount of bypass air, resulting in increased coil capacity. Coils are pitched in casing to permit full drainage to condensate outlet. Every square foot of face area produces equal heating capacity on full or modulated steam

supply. Available with inlet and outlet on same end or on opposite ends. Can be supplied with gas-tight casing. Tubes are of $\frac{5}{8}$ " O.D. by .035" wall copper. Casings 14-gauge steel. Sizes range from 12 to 48" face height and from 24 to 120" width. Circle No. 173 on Reader Service Card

Room Conditioners

Product: Three separate groups of models ("Room Weathermakers") for in-the-window installation.

Manufacturer: Carrier Corp., Syracuse, N. Y.

Features: Includes "Starline" and deluxe "Crestline" models in $\frac{3}{4}$ and 1½-hp sizes, and "Super Crestline" in $\frac{3}{4}$ and 1-hp cooling design which reduces electrical requirements while producing full rated capacity. Flush grille extends less than 2" into room with reversible



design to regulate direction of airflow. "Finger-flip" plastic controls project less than $\frac{1}{2}$ " above upper surface and become nearly invisible at distance of few feet. Control device provides modulated control of temperature and better regulation of humidity, manufacturer says. Automatic controls for ventilation and pumping out of exhaust air which start fan as soon as outside air damper setting is made. Draftless air circulation is insured by reversible grille. When turned one way, grille directs cooled air toward ceiling as it passes over 45-degree angle vanes. When reversed, air leaves at 15-degree angle, and thus can be made to flow to farthest corners of long, narrow rooms. All grilles are neutral shade.

Circle No. 174 on Reader Service Card

Heating Equipment

Product: Complete gas and oil-fired furnace line.

Manufacturer: Gibson Refrigerator Co., Greenville, Mich.

Features: High-boy designed especially for closet, utility room, and limited spaces. Compact unit in five sizes from 70 to 125,000 Btu gas-fired and from 75 to 200,000 Btu in various oil-fired models. Conventional models are available with "Even-Flow" that provides constant air circulation and even temperature through design that controls air delivery and temperature by fan modu-

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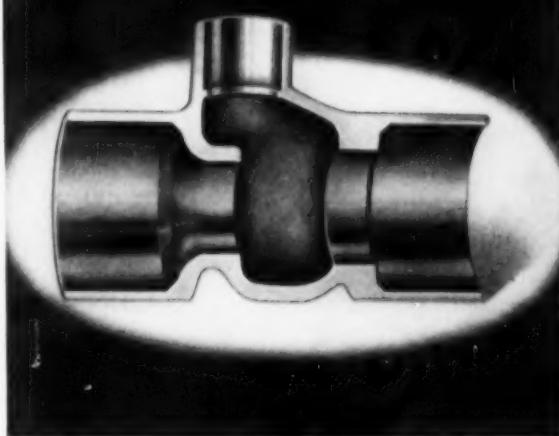
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Circle No. 56 on Reader Service Card

lation. Basement model available in four sizes from 100 to 150,000 Btu gas-fired and from 75 to 145,000 oil-fired. Counter flow models are available in 70 to 125,000 Btu, gas-fired, and in 74 to 90,000 Btu, oil-fired. Also in 75,000 through 200,000 oil-fired suspended. Wall furnaces, ranch-type, gravity equipment round out line.

Circle No. 175 on Reader Service Card

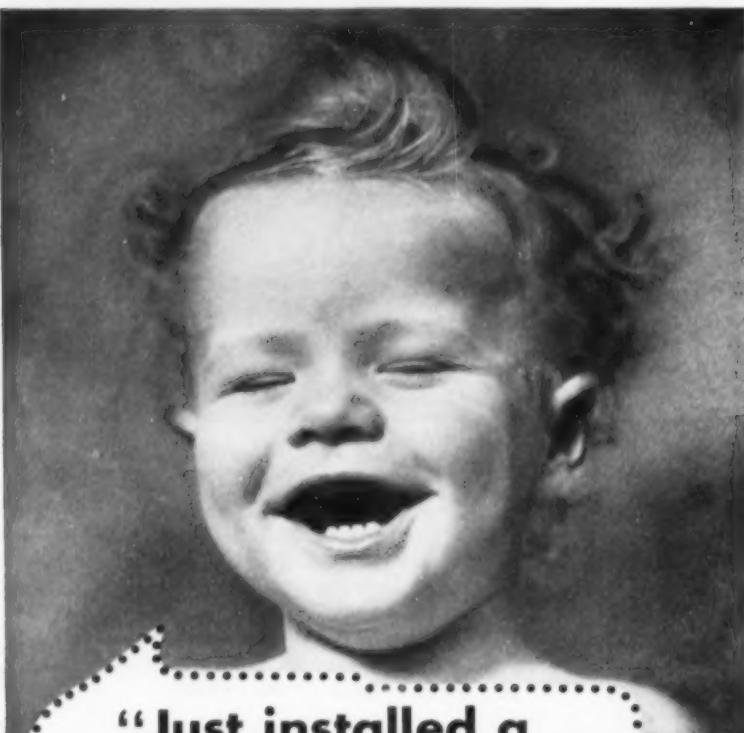
Fibrous Insulator

Product: "Basaltwool" with excellent fibrous insulating material.
Manufacturer: Thermo-Sound

Products, Div. of Kittell-Lacy, Inc., El Monte, Calif.

Features: Made from Basalt volcanic rock. Long fibre lengths permit use in mat form without use of binder. Millions of tiny sound traps help absorb sound. Will not burn or support combustion. Fibres are gathered in batt form and stitched with wire. No binder of any kind is added. Will not rot, decay, or induce corrosion in adjacent metal surfaces. Batts are available in densities from 3 to 6 lbs. per cu.ft., and in widths and thicknesses for most heat and sound insulating applications.

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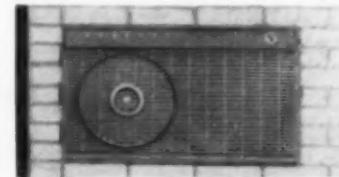
In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ontario

Circle No. 57 on Reader Service Card

'57 Conditioner Line

Product: 1957 "Thin-Lo" line of 13 air conditioners.

Manufacturer: Fedders-Quigan Corp., Maspeth, N. Y.

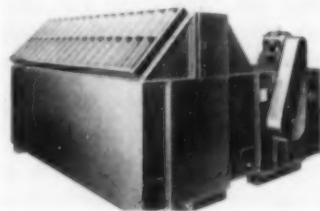


Features: Thinnest and lowest cabinet design ever, manufacturer says. Fully adaptable for wall-thin, through-the-wall installation, or window mounting without overhang. Series "A" cabinets measure 16" high, 27" wide, and 16" deep. Includes $\frac{3}{4}$ and 1-hp models, in addition to $7\frac{1}{2}$ ampere $\frac{3}{4}$ " Supreme". Series "B" cabinets (16 x 27 x 19"), multi-room 115 volt, 1-hp unit (shown) accomplishes 1-hp cooling without bringing in 208-230 volt service. Also in this size is $7\frac{1}{2}$ ampere, $\frac{3}{4}$ -hp "Custom Supreme", and $1\frac{1}{2}$ -hp air conditioner. Central-type systems offer 2-hp "Transomatic" and "Adaptomatic" air-cooled units. Both have push-button, remote controls. Former is designed for store-transom installation and latter for attic or basement. Line offers electronic purifier units equipped with electronic filter. Two models have reverse cycle heat pumps which permit using machines to heat as well as cool. All models have louvered outer cabinets and concealed weather bureau controls which automatically regulate for necessary comfort. Rotating weather wheel permits full 360 degree control of air-flow direction for draft-free cooling.

Circle No. 177 on Reader Service Card

Central Conditioner

Product: "Multi-Zone Climate Changer", central air conditioner

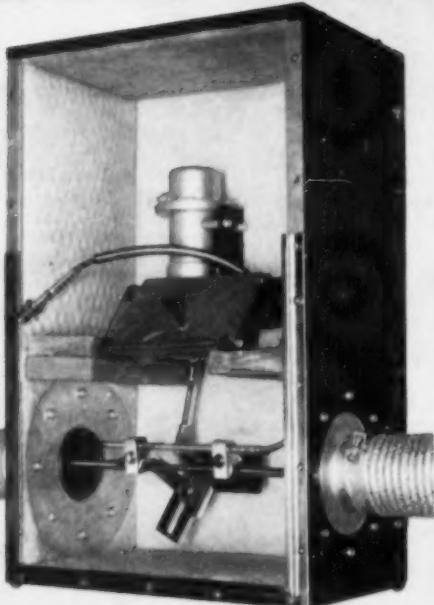


designed to accommodate up to 25 zones with independent and variable conditioning control.

Manufacturer: Trane Co., La Crosse, Wisc.

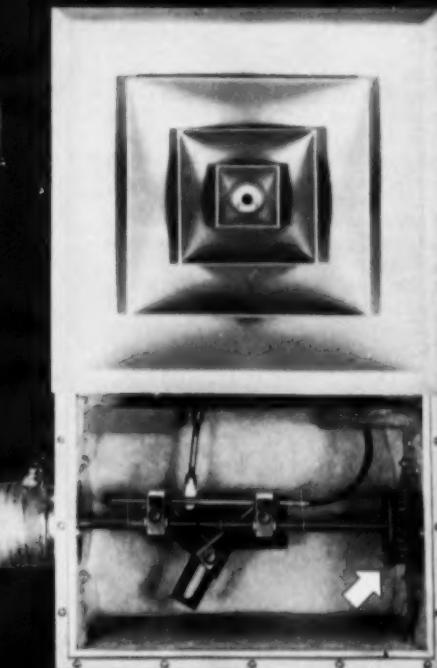
Features: Ideal for buildings where one or more zones call for maximum cooling while other zones require lesser degrees of cooling, and heating. Supplies any combination

SECTION 2



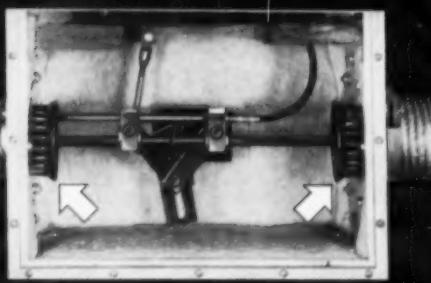
Anemostat High Velocity sound attenuation chamber

SECTION 1

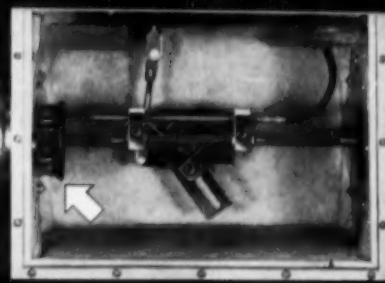


Hot inlet open in Section 1.
Anemostat in place covers Section 2

Hot and
cold inlets
50% open



Cold inlet
open



How to mix and diffuse high velocity air automatically

The Anemostat High Velocity sound attenuation chamber is divided into two sections. Both hot and cold air from the main risers enter Section 1, which is an acoustically lined blending chamber, in which the volumes of air are controlled by the Anemostat serrated rocket-socket valves. When the thermostat is set, the rocket-socket valves move slowly back and forth, thereby adjusting the volume of air supplied through the hot and cold inlets. The velocity of the air which enters Section 1, at from 3500 to 6000 fpm, is automatically reduced by expansion.

As the blended air meets the temperature

requirements of the thermostat, it passes through a baffle arrangement into the acoustically lined Section 2 of the chamber, further reducing the db rating of the air.

The air then passes through the Anemostat Air Diffusers, where the aspiration effect causes mixing of room and supply air within the diffuser, resulting in further temperature equalization. The diffuser then delivers to the occupants of the room draft-free air at the desired temperature.

The Anemostat All-Air High Velocity distribution system offers other important advantages. It can be used with smaller

than conventional ducts. It can be installed faster and at less cost. It requires no coils, thus eliminates leakage, clogging and odors. Furthermore, Anemostat round, square and straightline diffusers with high velocity units blend into a wide variety of architectural designs.

*Write for 1956 New
Products Bulletin and
Selection Manual 50 to
Anemostat Corporation of
America, 10 E. 39 Street,
New York 16, N. Y.*

*Anemostat: The Pioneer of
All-Air High Velocity Systems*



tion desired: Complete air conditioning; cooling only; heating only; cooling and ventilating; heating and ventilating; heating and humidification; or ventilating only. Eliminates need for reheat coils and their separate controls in ducts leading to individual zones. Allows for job-site zoning flexibility through improved discharge damper section design, permitting simplified damper grouping and duct installation. Provides advantage of using just one source of either chilled water or refrigerant. Available in nine sizes with capacities ranging from 1700 to 2900 cfm of air. Will supply complete year-round air conditioning for en-

tire medium-size building. Uses any type of cooling and heating coil including chilled water, direct expansion refrigerant, steam or hot water.

Circle No. 178 on Reader Service Card

Gas-Fired Heater

Product: "Counterflow" gas-fired, forced air heaters for industrial applications.

Manufacturer: Dravo Corp., Pittsburgh, Pa.

Features: Circulatory air flow provides uniform warmth. Automatic operation with each heater controlled

by its own thermostat. Equipped with louvered directional nozzles and are capable of distributing heated air at distances up to 150', reducing duct requirements. Heater fans may be operated to circulate air for cooling effects of ventilation. A monetary-savings of 35% resulted from one plant application, manufacturer says.

Circle No. 179 on Reader Service Card

Air Filter

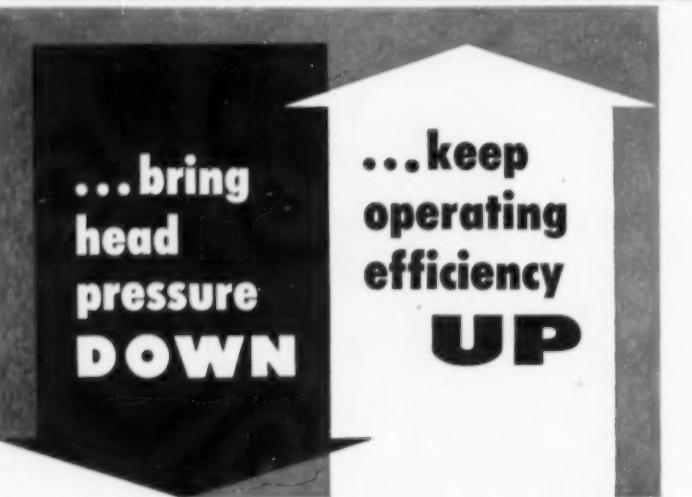
Product: "Golden Dust-Stop" air filter.

Manufacturer: Owens-Corning Fiberglas Corp., Toledo, Ohio.



Features: Composed of thinnest glass fibers ever used for this purpose, manufacturer says. Available for both frame and pad-type applications. Filter roll package facilitates pad filter installation. Frame filters are available either singly or in four-packs, containing full season supply for average homeowner. Easier-to-handle filter media.

Circle No. 180 on Reader Service Card



with **anco** condenser cleaner

ANCO Condenser Cleaner removes scale and rust from condensers within 2 to 15 hours, depending on the thickness of the scale. The head pressure drops to normal and the condenser's efficiency is restored. ANCO Condenser Cleaner is an exclusive dry formula which is simply dissolved in the sump while the system is in operation. It is equally effective in evaporative condensers and those with separate cooling towers.

Free WATER TREATMENT MANUAL

A complete booklet on the control of scale, rust and algae in refrigeration and air conditioning systems. No service department should be without a copy. It's yours for the asking.

Sold by wholesalers of air conditioning and refrigeration supplies



Circle No. 42 on Reader Service Card

Shaded Pole Motor

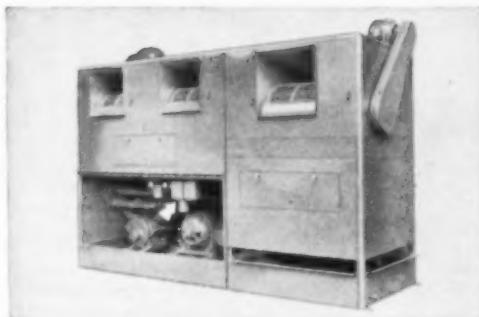
Product: New 4-pole, shaded pole motor (ratings from 1/25 to



1/10 hp) especially designed for unit heaters, home air conditioning units, and fans.

Manufacturer: Fasco Industries, Inc., Rochester, N. Y.

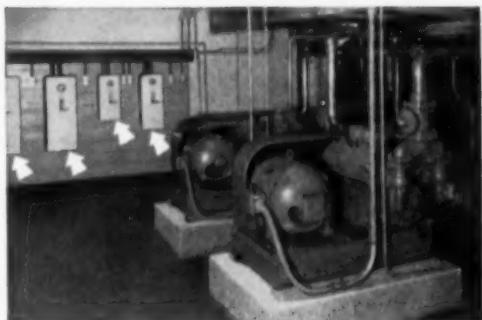
ALLEN-BRADLEY Motor Controls and Accessories for Refrigeration and Air Conditioning



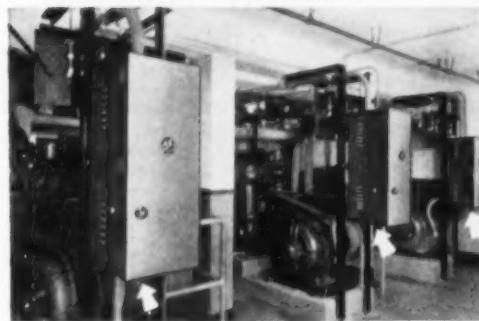
Bulletin 709 Across-the-Line Starters



Bulletin 837 temperature control



Bulletin 712 Combination Starters



Bulletin 640 Manual Resistance Starters



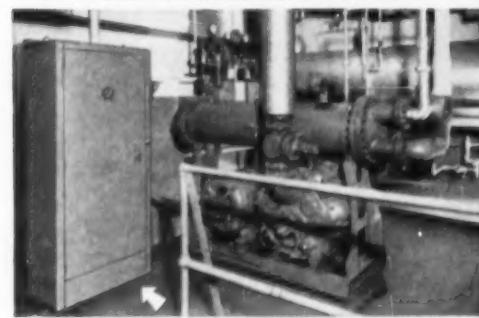
Bulletin 836 pressure switch



Bulletin 849 pneumatic timer



Bulletin 646 Manual Autotransformer Starters



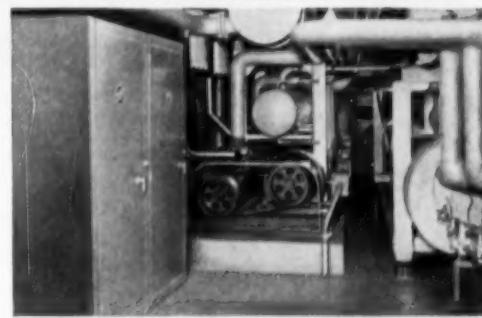
Bulletin 740 Automatic Resistance Starter



High and low pressure cutout



Bulletin 800 3-way selector switch



Bulletin 746 Automatic Autotransformer Starters



The Sign of Quality Motor Control

Allen-Bradley motor starters have the simplest contact mechanism yet devised for air-conditioning or refrigeration installations . . . only ONE moving part . . . the solenoid plunger which carries the double break contacts.

There are no trouble-causing pins, bearings, or jumpers. The cadmium silver alloy contacts never need cleaning, dressing, or filing . . . eliminating costly and troublesome maintenance.

Allen-Bradley timers, pressure and temperature switches are reliably accurate . . . precision operation is maintained over long periods of service.

Specify Allen-Bradley—the name that stands for "Quality" motor control. You cannot make a better selection!

Allen-Bradley Co.
1340 S. Second St., Milwaukee 4, Wis.
In Canada—
Allen-Bradley Canada Ltd., Galt, Ont.



Features: Extremely quiet in operation, motor uses unique pole configuration which produces better flux distribution, resulting in higher efficiencies and better power factors, manufacturer says. Wound-in-place coil design provides better copper efficiency and eliminates magnetic wedges, manufacturer says. Improved sintered oil-less bearing in conjunction with larger-capacity, high-quality oil-retaining wicks. Speed torque characteristics are designed for multi-speed operation. Available for single, two, or three-speed operation on types of equipment previously described.

Circle No. 181 on Reader Service Card

Thermostat

Product: Models T-40 and T-41 line voltage thermostats for cooling and heating operations.



Manufacturer: Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Features: T-40 is ideal for low-mass, quick heating-quick cooling units. Horizontally mounted, responsive to as little as 4 degrees of temperature change. Designed to cycle up to 15 to 20 times per hour under normal 50% heating load requirement. T-41 cycles only three to six times an hour. Used with large-mass heating elements of type normally mounted in ceilings, floors, and similar installations. Operating differential is one degree. Both instruments operate without supplemental relays or transformers.

Circle No. 182 on Reader Service Card

With motor manufacturers C-D Motor Capacitors are first by far. With motor, refrigerator, air conditioning, oil burner and household appliance maintenance servicemen, C-D capacitors are first choice. You can be sure of C-D's outstanding field performance record and ease of installation. This, plus C-D's great range of types makes it the preferred line among men of experience. That's why Distributors who know, carry the complete Cornell-Dubilier line.

**WANT THE
BEST
IN MOTOR
CAPACITORS?
C-D
TO BE SURE!**



Always insist on C-D — there's a right type for every motor. Ask your C-D distributor for your free copy of C-D's famous motor capacitor Manual and Catalog No. 163. He's listed in your classified 'phone book. Cornell-Dubilier Electric Corporation, Dept. CR-116 South Plainfield, New Jersey.



CONSISTENTLY
CORNELL-DUBILIER CAPACITORS

PLANTS IN SOUTH PLAINFIELD, N. J.; NEW BEDFORD, WORCESTER AND CAMBRIDGE, MASS.; PROVIDENCE AND HOPE VALLEY, R. I.; INDIANAPOLIS, IND.; SANFORD AND PUGUAY SPRINGS, N. C.; SUBSIDIARY: THE RADIART CORPORATION, CLEVELAND, O.
THERE ARE MORE C-D CAPACITORS IN USE TODAY THAN ANY OTHER MAKE

Circle No. 60 on Reader Service Card

88

A NEW "Radiation Selector Kit", designed specifically to save wholesaler salesmen and contractors time and money, has been developed by The Trane Co. This handy kit makes it possible to accurately figure the right amount of baseboard and proper convector capacity for any job.

The kit includes a pad of radiation work sheets for use in recording design conditions and dimensional data for individual rooms, a sturdy dial chart with heat loss calculator on one side and baseboard selector on the other, along with a convector selector card. Easy-to-follow instructions are included.

According to Trane, the kit makes it possible to use approved engineering methods for heating equipment selection while eliminating the use of voluminous tables, curves and slide rules.

Contractors can obtain kits, at \$1.00 each, through wholesaler of Trane radiation products.

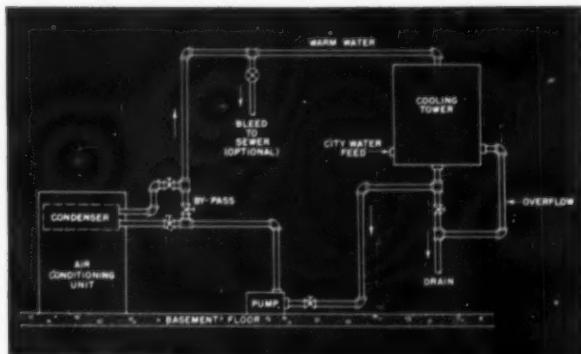
Plaster Mounting Ring

Product: Model PMR plaster mounting ring for flush mounting ceiling diffusers.



Manufacturer: Titus Mfg. Co., Waterloo, Iowa.

Features: Cuts ceiling diffuser flush mounting costs up to 80% and prevents diffuser from ever sagging away from ceiling, manufacturer says. Serves as combination mounting ring and plaster ground. For installation, slip neck of ring over duct and then secure it to lathing channels or ceiling construction.



QUIETER PUMPS FOR COOLING TOWER APPLICATIONS



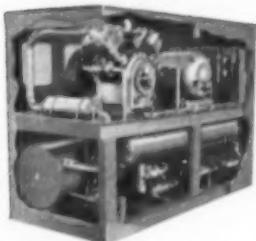
B&G 1522 CENTRIFUGAL PUMPS



**B&G SERIES 1531-B
CENTRIFUGAL PUMPS**

Featuring vertical split case design...self-lubricating, leak-proof "Remite" mechanical seal...latest NEMA motors. Super-finished shaft oversized for minimum deflection. Impeller is of sound hydraulic design, with balancing ring and relief holes to reduce thrust. Capacities to 1200 GPM, heads to 420 ft. Many sizes carried in factory stock.

**B&G PACKAGE
LIQUID COOLER**



A complete cooling unit for homes, apartments, commercial and industrial buildings. Low pressure drop through evaporator—non-recycling pump down—integrated electrical control system—complete wiring—are a few of many outstanding features. Send for Bulletin HB-755.



Send for your free copy of the B&G Six Step Manual for Designing Cooling Tower Systems.



BELL & GOSSETT

C O M P A N Y

Dept. EO-45, Morton Grove, Illinois

Canadian Licensee: S. A. Armstrong Ltd., 1400 O'Connor Drive, W. Toronto

Circle No. 61 on Reader Service Card

being used with two screws. No holes to cut in plaster. No trimming or patching necessary. Automatically provides correct size and position of ceiling opening and centers diffuser to it.

Circle No. 183 on Reader Service Card

Temperature Control

Product: Type E27A remote bulb temperature control for air conditioning applications.

Manufacturer: United Electric Controls Co., Watertown, Mass.

Features: Contains two switches and may be used in place of two

separate single-switch controls. Consists of bulb, capillary tube, bellows, and control head. Bellows attached to control head and connected to remotely-located bulb by means of capillary tube. Bulb, capillary tube, and bellows are liquid-filled and incompressible. Liquid expands and causes uniform linear motion of bellows plunger when heat is applied to sensitive bulb. Temperature settings are made by rotating single-turn knob and pointer against calibrated scale. Available with range spans of 100 F or 200 F between limits of -150 F and 650 F, and with on-off differentials of approximately 1 and 2 degrees. Adjusting screw is

attached to each switch so that each switch can be adjusted individually up to maximum span of approximately 15 F between switch settings. Can be provided with two tapped holes on adjustment side of case for flush mounting.

Circle No. 184 on Reader Service Card

Sidewall Exhauster

Product: Model W sidewall exhauster.

Manufacturer: Carnes Corp., Verona, Wisc.



No. 1 industry favorite

PARAGON
300-MB time switch is right for
90% of all refrigeration defrosting jobs

No. 1 favorite? You bet! From the day the Paragon 300-MB switch was introduced, it has been the standard of the refrigeration industry — and its uses are growing daily. It's standard for hot gas or electric heat defrosting . . . it automatically controls fans, solenoid valves, compressor motors and other equipment. Install it, set it, then forget it.

Insist on famous Paragon top-quality construction necessary for heavy-duty service — vital to ending call-backs—a must for guaranteeing profits. Order from your Refrigeration Equipment Wholesaler or write Dept. 1888 for bulletin.

Also write for complete facts on these famous Paragon timers

PARAGON
TWO RIVERS, WISCONSIN

ELECTRIC COMPANY
WORLD'S FOREMOST MANUFACTURER OF TIME CONTROLS

Circle No. 63 on Reader Service Card

- ✓ PROVIDES DEFROST CYCLES from 15 to 120 minutes — 1 to 8 operations per day.
- ✓ LONGER SWITCH LIFE assured by heavy-duty, industrial type motor.
- ✓ SHOCK-PROOF TERMINAL BLOCK means faster, safer installation.
- ✓ AMPLE CAPACITY — 30 amps, 120/240 volts, single or double pole. Offers flexibility not found in any other control.



Features: All-aluminum housing. Compact unit has lessened overall projection and much higher degree of ventilation through motor compartment. Motor mounted out of air stream. Backwardly inclined centrifugal wheel available in four sizes with capacity range from 150 to 1850 cfm.

Circle No. 185 on Reader Service Card

Clock Thermostat

Product: Model T852 electric clock thermostat styled to complement interior decorating schemes.

Manufacturer: Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Features: Automatic model has gold body and clear, plastic-covered white face. Face and temperature-indicating scale have modernistic motif. Mercury thermometers have been replaced with coiled bi-metal element believed to be more precise and actuating a slim pointer.

Circle No. 186 on Reader Service Card

LIMA OPENS BRANCH OFFICE IN DETROIT

Lima Electric Motor Co., Lima, Ohio, has opened a new branch office at 6432 Cass Ave., Detroit, Mich., to handle original equipment electric motor and gearshift drive sales. The new office is headed by Anthony N. Pellegrini.

**BUY FROM YOUR
REFRIGERATION WHOLESALER**

BY THE MONTH ...

Continued from page 75

formed serviceman call on a customer rather than a salesman. He tells the customer that he can't make any more service calls because of the cancellation, but that payment will reintroduce the service.

"As stated before, we haven't lost a customer yet as the result of a cancellation either by the customer or ourselves."

Four times annually, Adkins-Latta sends out some direct mail promotion to several hundred prospects within a three-mile radius of the company's location. These include postcard notices and letters having postpaid cards inserted for return to the office. The monthly payment plan is explained and the firm's 24-hour service is highlighted.

After every service call, a bill showing the labor charges is sent to the customer. This bill is marked paid. This serves as a reminder to the customer that it costs less

to maintain a monthly service contract than to pay out the cost of labor charges each time that service is required. Such reminders are great helps in keeping accounts continually on this firm's books.

"Our monthly payment business is very important to us in keeping our business stable all year 'round," says Latta. "We know every month what our service policy income will be, and we can guide our business accordingly.

Eases Peak Service Load

"We also can inspect our customer's units almost at our own convenience which means that we aren't unduly rushed during the normally busy season. Because of this, we can handle all the service work we can get, even during peak periods, without having to add extra help.

The firm maintains a record of all air conditioner sales. When the guarantee period runs out, the customer is notified and the monthly service policy plan is presented. Persistent follow-ups virtually assure selling a service policy.

REGION 6 WHOLESALERS PLAN PRODUCT CLINIC

An educational and panel-discussion-type meeting, in which the audience will be invited to participate has been set for Dec. 14 and 15 at the Terrace Casino of the Morrison Hotel, Chicago, by Air Conditioning and Refrigeration Wholesalers, Region 6. Members of the committee are James Alter, John P. Glass Jr., and E. Peter Sorensen.

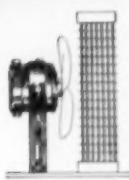
Individual conference booths manned by representative manufacturers will be available to all registered guests for discussion of specific products and problems created by new equipment now offered to the trade.

The session also will include a banquet, cocktail party, and entertainment. The entertainment responsibility has been accepted by Herman Goldberg, who has staged highly successful performances at past functions.

Tickets and registration forms will be available through all Region 6 ARW personnel or at the clinic.



CONDENSER FAN MOTOR
1½ THROUGH 16 WATTS



EASIER REPLACEMENT

with NEW *Redmond* TYPE AM-4
SINGLE BEARING MONOMOTOR

All-Angle Operation—Interchangeability—Low Costs
Make This Your No. 1 Replacement Motor

These Features Are Your Assurance of Customer Satisfaction

1. INTERCHANGEABLE—Accommodates all standard brackets and special mountings.
2. ALL-ANGLE OPERATION—Designed for all-position mounting, vertical shaft up, shaft down, or any angle. Now you stock only one motor.
3. LIFETIME LUBRICATION—Extra large oil reservoir permanently sealed for lifetime lubrication. Guaranteed not to leak oil in use or shipment.
4. UNI-CAST® CONSTRUCTION—Gives a rugged, lightweight motor with smooth, whisper-quiet operation for years of continuous service-free use.
5. TRI-FLUX® DESIGN—Lowers operating costs through increased efficiency.



Redmond Distributors, Inc., Owosso, Michigan

REDMOND DISTRIBUTORS, INC.
Owosso, Michigan.

- Send me your new AM-4 booklet.
 Mail me your 4-page catalog describing the complete line of Redmond motors, blowers, fan blades, replacement kits, and accessories.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____



Quality pure Quantity sure



WITH...
Charg-A-Can®
PACKAGED
REFRIGERANTS

- Factory controlled purity
- Assured accurate charging
- No cylinders, no deposit

There's never a doubt when you use American Potash & Chemical Corporation's accurate, dependable, and economical Charg-A-Can packaged refrigerants.* Dependable quality and positive quantity are both assured because Charg-A-Cans are filled under carefully controlled factory conditions, with material expertly analyzed for purity and moisture content. Service efficiency is increased because Charg-A-Cans save time, eliminate waste, do away with costly charging racks and cut down on heavy storage and transportation requirements. Stock-up on Charg-A-Cans today and watch service profits soar!

Stocked by refrigeration wholesalers everywhere.

*Charg-A-Can refrigerants are packaged as follows:

'Freon-12"	1 lb.
'Freon-22"	2 lb.
'Freon-114"	1 lb.
Sulfur Dioxide	1 lb.
Methyl Chloride	2 lb.

A DIVISION OF A. L. SMITH
DE REMOINS & CO., INC.



For your convenience,
Charg-A-Cans are available
in six-pack containers
for greater ease in han-
dling, stocking, display.

TRONA

REFRIGERATION DEPARTMENT
American Potash & Chemical Corporation

3100 EAST 26TH STREET, LOS ANGELES 23, CALIFORNIA 99 PARK AVENUE, NEW YORK 16, NEW YORK

Circle No. 64 on Reader Service Card

NOVEMBER, 1956 • COMMERCIAL REFRIGERATION

VENDO ACQUIRES ASSETS OF VENDORLATOR MFG.

Vendo Co., Kansas City, Mo., has acquired the assets of Vendorlator Mfg. Co., Fresno, Calif.

Through the transaction, announced by directors of both companies and subject to approval by shareholders, it is anticipated that sales will be increased to approximately \$40,000,000 for the affiliated companies.

Vendo manufactures vending equipment for the bottlers of Coca-Cola, automatic milk and ice cream machines for the dairy industry, a cookie machine, and currently is introducing machines which vend hot soups and both hot and chilled "main-dish" foods. Vendorlator manufactures vending units for all soft drink bottlers and in addition holds subcontracts for aircraft parts and manufactures central system air conditioning equipment.

EXHIBIT AREA EXPANDED FOR ASHAE EXPOSITION

More than 450 exhibitors have applied for space at the 13th International Heating & Air-Conditioning Exposition at the Chicago International Amphitheatre, Feb. 25 to March 1, 1957. This means a greater number of exhibitors have contracted for a greater amount of floor space than at any like display.

Space requirements have continued to amount at such a rate that the north wing of the amphitheatre is more than half filled with exhibits. The expanded floor plan, originally expected to afford ample area, represents a 15% addition to the size that was anticipated for this record-breaking show.

FRIGIDAIRE "GRADUATES" FIRST "HOME" CLASS

Some 40 executives from Frigidaire's national distributing organization recently completed a brief but intensive factory session devoted to residential air conditioning.

According to L. W. Smith, Frigidaire manager of air conditioning and commercial sales, the

unique training course served to provide a dress rehearsal for similar presentations to dealers in the field.

Curriculum for the two-day meeting covered basic refrigeration fundamentals, load determination, equipment selection, system design, and heating and air conditioning applications.

Each district representative, who attended the school, will shortly begin application field training for Frigidaire dealers in his territory.

HUPP STREAMLINES FOREIGN OPERATIONS

Hupp International has been formed as a division of Hupp Corporation. Donald S. Smith, Hupp vice president and director, is president of the new division which will have responsibility for administration of all the corporation's activities outside the continental United States.

**BUY FROM YOUR
REFRIGERATION WHOLESALER**

End All Doubt!



SHOWS:

Total running time
Total elapsed time
on 24-hour dial

This great addition to the "Serviceman" line does a vital job supremely well. Its white hairline pointer shows total time of test; red pointer shows total running time. It is easier to read, use, and interpret than a recorder . . . has no charts or leaky pens to bother with . . . yet it is very moderately priced.

Two models (opposite) cover all conditions. Note sturdy case finished in attractive hammerloy gray with sharp white numerals on black dial . . . also suction-cup feet for firm placement without damage to finish. This is the instrument you've been waiting for. Write for details, or

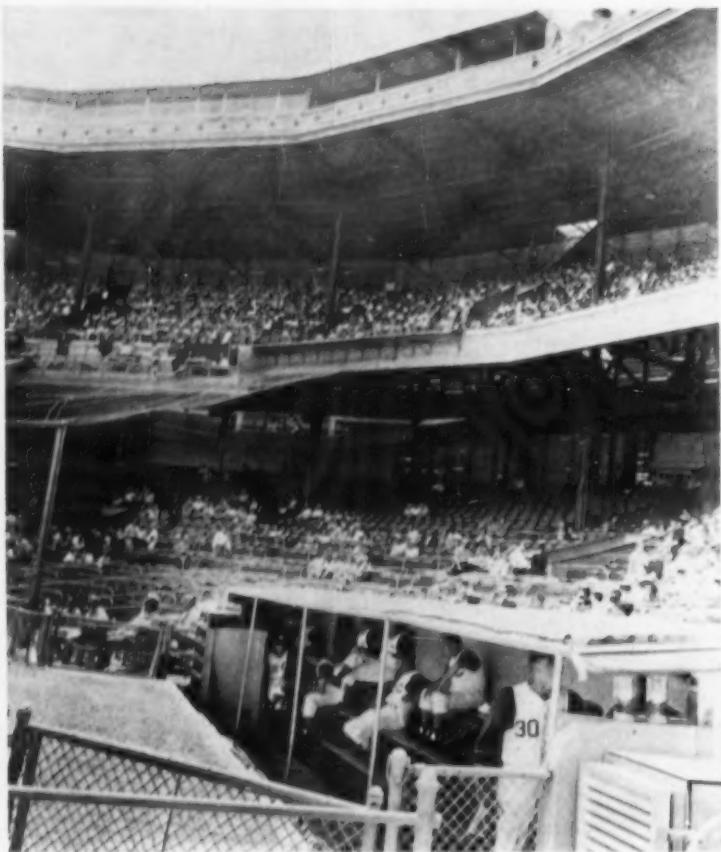
See your Wholesaler

MARSH INSTRUMENT CO., Sales Affiliate of Jrs. F. Marsh Corporation
Dept. P, Skokie, Ill. • Marsh Instr. & Valve Co. (Can.) Ltd., 6407 103rd St.,
Edmonton, Alta. • Houston Br. Plant: 1121 Railwall St., Sect. 16, Houston, Tex.

Refrigeration Instruments

MARSH
GAUGES • WATER REGULATING VALVES • SOLENOID VALVES • HEATING SPECIALTIES
Circle No. 65 on Reader Service Card

Reds Cool Off In Flag Drive



HOTTEST TEAM in the National League during much of the past summer was the Cincinnati Redlegs . . . on the baseball diamond. In the dugout, they were the coolest, thanks to air conditioning. Dugouts for both the home and visiting teams have been air conditioned, along with the press box, broadcasting booth, press room and TV monitor room. Dugouts are air conditioned by a system which "encloses" them with a 36-ft. curtain of dry cool air and shields out the heat. Air is discharged from grills along the length of the dugout ceiling, using a 5 hp Frigidaire water-cooled condensing unit in combination with a coil and blower unit. Press box is enclosed with a glass front, and insulated on top, back and sides; 2" for ceiling and 1" on sides and wall. Air distribution problem in the long, narrow enclosure was solved by running a duct along the press box roof and using eight semi-circular ceiling diffusers to discharge cool air into the box, with no re-circulation. A 5 hp air cooled condensing unit and matching coil and fan assembly serves this system. Temperature differential of 10 F is maintained in the dugouts, and 15 F in the press box.

ASHAE LISTS ANNUAL MEETING DATES 1957-60

Annual meeting dates of the American Society of Heating and Air-Conditioning Engineers are announced as follows by John W. James, president of the group: 63rd annual meeting, Chicago, Feb. 25-28, 1957; 64th, Pittsburgh, Pa., Jan. 27-29, 1958; 65th, Philadelphia, Jan. 26-29, 1959; and 66th, Dallas, Feb. 1-4, 1960.

James also announces that three Heating and Air-Conditioning Expositions, under the auspices of ASHAE, have been approved as follows: 13th International Heating and Air-Conditioning Exposition, Chicago, Feb. 25 through March 1, 1957; 14th, Philadelphia, Jan. 26-30, 1959; and 2nd Southwest Heating and Air-Conditioning Exposition, Dallas, Feb. 1-5, 1960.

BENDIX-WESTINGHOUSE BUYS DIV. OF SERVEL

Bendix-Westinghouse Automotive Air Brake Co., Elyria, Ohio, has bought Servel, Inc.'s assets and facilities for the manufacture of refrigeration compressors.

Bendix-Westinghouse will operate these facilities in two former Servel buildings at Evansville, Ind., for production of electric motor-compressors of $\frac{1}{4}$ to $7\frac{1}{2}$ -hp for use by air conditioning and refrigeration manufacturers.

The purchase includes 12 $\frac{1}{4}$ acres of land and buildings, machinery and equipment, inventories, patents, trade marks, and technical information used in the production of these products.

WORTHINGTON COOLS NASHVILLE SKYSCRAPER

The new Life and Casualty Bldg. in Nashville, Tenn., which will have 30 floors and a height of 409', is being air conditioned completely by Worthington Corp.

Worthington will furnish both refrigerating and air conditioning systems capable of supplying 600 tons of refrigeration. They will provide all of the chilled water necessary for the perimeter and interior air conditioning zones.

The structure also will have a basement, and a three-story penthouse to house machinery.

Circle No. 66 on Reader Service Card

Use *Stic-Klip®* for fast Insulation Installation

ON AIR CONDITIONING AND VENTILATING SYSTEMS
FOR COLD STORAGE PLANTS, BUILDINGS AND SHIPS.



Stic-Klips permanently bind almost any insulating material to masonry, wood, metal — flat, corrugated, curved, unusual-shaped. This modern method eliminates drilling, puncturing metal — saves time and money.

Write for illustrated booklet on any of these applications.

Stic-Klip® MANUFACTURING CO.
54 Regent St., Cambridge 40, Mass.

Stop Oil Leaks

...in oil storage tanks, pipes or
containers, oil-filled transformers...
even while oil is flowing!

Here is the quick new way to stop oil leaks instantly.

Just rub OYLITITE-STIK into the leak and it's sealed. Doesn't become brittle; is not affected by heat or cold; withstands normal vibration. On every job, every service call, take OYLITITE-STIK along. See your jobber, or write us for full information.



LAKE CHEMICAL CO.

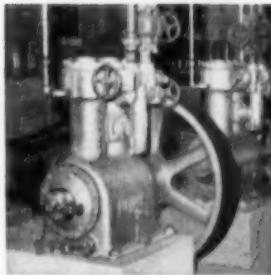
3107 W. Carroll Ave., Chicago 12, Ill.

Circle No. 67 on Reader Service Card
& AIR CONDITIONING • NOVEMBER, 1956

IN REFRIGERATION *it Pays to Know* **HOWE**

COOL IT

with one or more of Howe's complete line of modern space-saving automatic ammonia compressors. Sizes—2 to 150-ton capacity. Built for maximum service with minimum cost.



FREEZE IT

with Howe Booster Compressors. Food freezing techniques to meet today's rigid requirements. Can be engineered and built to your local plant conditions with equipment manufactured by Howe.



HOLD IT

A complete line of high efficiency unit coolers, polar circle coils, fin type coils — designed to handle any size of storage cooler or storage freezer. For preserving fresh and frozen foods.



WRITE FOR LITERATURE

CONTRACTOR-DISTRIBUTORS — Several exclusive territories still open — Your inquiry invited.

**HOWE
ICE MACHINE CO.**

Since 1912, manufacturers of ammonia compressors, condensers, coolers, air coils, locker freezing units, air conditioning (cooling) equipment.

2819C MONTROSE AVE. • CHICAGO 12, ILLINOIS
Distributors in Principal Cities — Cable Address HIMCO Chicago

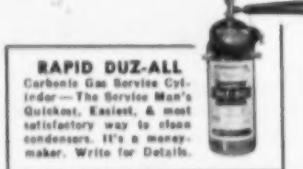
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- Saves Valuable Storage Space
- Saves Installation Time
- More Economical than Home-Made Racks
- Raises Units off Floor — for easier servicing for flood protection for easier cleaning
- Fire Hazard Protection — all metal construction
- Improves Installation appearance

THE SPACESAVER offers a sturdy, dependable rack, quickly and easily installed. Packaged in heavy storage carton. Requires very little storage space. Assembled in a few minutes.

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DESIGN-ENGINEERED FOR
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FINE PRODUCTS CO.
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96

PLAN — INSTALL . . .

Continued from page 70

complete with magnetic starters, it is necessary to connect to the terminal strip of the unit from a power source through a fused disconnect switch or circuit breaker.

Local codes should always be adhered to in the matter of electrical connections.

Normally, in self-contained units, control will consist of an on-off thermostat controlling the compressor motor. Larger units can be furnished with face and bypass dampers affording modulating control and compressor unloading. Deluxe units are provided with a built-in thermostat that will cycle the compressor in response to the temperature of the return air stream.

Room type thermostats of the modulating or on-off type, as applicable, must be furnished for the larger commercial units. This can be in the form of a return air thermostat, if desired. Deluxe units used for remote installation may

also be controlled by a room thermostat.

Water requirements will vary with the sections of the country. In some areas, city water or well water is available at reasonable cost and will be the economical solution. Units utilizing city water or well water for condensing purposes should be provided with a water regulating valve.

Where water costs are prohibitive or local codes call for water saving devices, a cooling tower is usually used. There is a definite trend in all municipalities for the requirement for water saving devices.

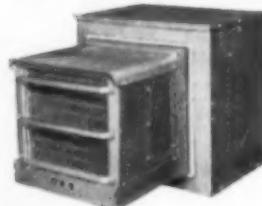
Consideration should be given to units with built-in evaporative condensers on larger jobs where water saving is a factor.

In most areas, water treatment of some kind will be required. If applicable in your area, consult any reliable treatment firms for recommendations and details.

**BUY FROM YOUR
REFRIGERATION WHOLESALER**

A NEW AND DIFFERENT COOLER UNIT FITS ANY ICE BOX, COOLER, CUSTOM BUILT CABINET

TAYLOR-BURCH *packaged* COOLER UNITS



TAYLOR-BURCH PACKAGED COOLER UNITS are the very latest development in modern cooling practices. No Water used at all. They defrost automatically, are completely air cooled, and the units are hermetically sealed with the gas and oil charge brazed in. No maintenance required, fan motors are self-oiling and the electrical system is completely enclosed. Installation is a low cost, simple operation . . . with no lost floor space.

Write Today
for complete information

Model No.	Size	Volts	Normal B.T.U. Reduction (Cooler Size)	Opening Required to Cooler Wall	Approx. Ship. Wt.
17M 1/6 H.P.	115	27	Cubic Ft.	12 1/4" x 12 1/4"	100#
25M 1/4 H.P.	115	40	Cubic Ft.	16 1/4" x 16 1/4"	150#
35M 1/3 H.P.	115	61	x 6" x 7 1/2"	16 1/4" x 16 1/4"	165#
50M 1/2 H.P.	115	61	x 8" x 7 1/2"	18 1/4" x 16 1/4"	180#
75M 3/4 H.P.	220	10	x 8" x 7 1/2"	20 1/4" x 20 1/4"	225#
100M 1 H.P.	220	12	x 12" x 7 1/2"	20 1/4" x 20 1/4"	300#

The above line of Taylor-Burch packaged cooler units is designed to operate from 33° and above.

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NOVEMBER, 1956 • COMMERCIAL REFRIGERATION



**"For servicing hermetics profitably,
Imperial gives me everything I need!"**

**Saves valuable shop
and on-job hours on
rechargeable units**

Imperial hermetic servicing kits and accessories are key equipment in shops known for fast, guaranteed servicing on sealed hermetic units. And that includes everything needed for charging, purging and testing!

It makes a lot of sense to equip with a line that gives you many high-speed working advantages. For example, in Imperial Hermetic Service Kits, the gauge and wheel handle are always attached to the valve, ready for instant use. You'll like the fast action of Imperial Kwik-Kupler fittings on charging lines.

Imperial piercing valves tap line at any point. Tap-a-Can dispensing valve saves extra refrigerant . . . eliminates waste.



NO. 99-FT CHARGING LINE — Highly flexible. Makes extra close bends. Has Kwik-Kupler connection at both ends. One end is 45° elbow. Seal gasket cannot be blown or dropped out. High burst-strength provides extra margin of safety.



NO. 189-F SERVICE VALVE KIT
— Eliminates a separate valve for each hermetic unit. Valve equipped with wheel handle for easy operation. Gauge reads from 30 in. to 60 lbs., retard to 250 lbs. Contains 9 adapters, 6 wrenches, 5 gaskets, plus handy service data chart on cover.



NO. 330-C TAP-A-CAN VALVE
— for dispensing canned refrigerant. Handy, positive-acting. Pierces can, and provides shut-off. For use on Charg-a-Can packaged refrigerant. Use just the refrigerant you need — save the rest for the next job.

NO. 341-C PIERCING VALVE —
Taps line at any point. Can be used on 4 sizes: 3/16, 1/4, 5/16 and 3/8-in O.D. tubing. Swivel anvil built into unit — cannot be dropped or lost.



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CONTRACTORS

NEWS • ACTIVITIES • PLANS

Labor-Management Problems Highlight RACCA Miami Beach Program Nov. 26-28

"**N**ATIONAL surveys and how to apply national averages to an individual business" will be just one of the important topics discussed at the annual convention of Refrigeration and Air Conditioning Contractors Association. The Balmoral Hotel, Miami Beach, Fla., will be the site for the meetings, Nov. 26-28.

Three committee members from United Association and three RACCA committeemen will comprise a panel for a forum on labor. This will be preceded by an address by a representative of the U.A. national office.

Four "management" talks—on profit-sharing plans, bid depositories, maintenance and service agreements, and national hospitalization and insurance plan—will be given. Attending contractors will have a chance to select additional problems for general discussion.

Dudley Cawthon, RACCA president, will speak Tuesday, Nov. 27.

Host Association, ACRA of Florida, is sponsoring exhibits of manufacturers' equipment in 24 booths. As an inducement to visit exhibits, prize tickets will be awarded daily to the first 25 persons visiting each exhibit. Drawings for prizes will be held daily.

Election of new RACCA directors will take place with officers elected by the directors.

In addition to the annual RACCA luncheon, a Mexican cocktail party and reception, and a Hawaiian "Luau Banquet" will highlight the social events.

Although the official program begins Nov. 26, registration and committee meetings will start Nov. 24, and directors will meet Nov. 25.

six Toledo, Ohio, concerns: Davidson Associates, Inc.; James A. Foley, Inc.; Hausman Steel Co.; Lumm Corp.; Schmidlin Brothers Heating; and John F. Stark & Sons.

M-H ENTERS ELECTRONIC AIR CLEANING FIELD

Minneapolis-Honeywell Regulator Co. has decided to develop and produce electronic air cleaning equipment, and will begin marketing activities in the field early in 1957, says Paul B. Wishart, president.

Honeywell has entered into a licensing agreement with Trion, Inc., a major producer of such equipment for nearly 10 years. The two firms will exchange research and engineering information, among other things.

Manufacturing operations will be carried out at Honeywell's Wabash, Ind., plant.

MCREEERY FIRM NAMED FOR WEATHERTRON

Appointment of T. King McCreery, Inc., Pittsburgh as a wholesaler for the General Electric Weathertron heat pump has been announced.

The firm will distribute Weathertrons in selected counties of Pennsylvania, West Virginia, and New York. T. King McCreery is the principal of the company.



WELL, WELL, WELL is probably as good a way as any of expressing how Anthony Purcello feels about the air conditioning system that serves his 30,000 sq. ft. bowling alley and shopping center in Omaha, Neb. Having a plentiful supply of well water available, Purcello installed a Hastings cold water cooling system that requires a total of 22 hp to operate the well pump and the blower motors.

NEW TITUS RESEARCH LABORATORY OPENED

The new \$50,000 Titus air distribution research and development laboratory was officially welcomed into the Titus Mfg. Corp. family recently with dedication ceremonies held at the lab.

Heart of the research laboratory is its two testing rooms. The big room (33' x 21' x 13') is operated under ideal temperature conditions. More critical work is carried on in the smaller area (21' x 15' x 8') which is a simulated living room.

Against two walls of the "living room"—the outside walls theoretically—outdoor weather conditions of either heat or cold can be simulated. Effect of a particular outlet in the test room then is checked by researchers. Typical data needed would be temperature at five standard levels in the room. These are the 4" (floor) level; 30" (sitting); 60" (breathing); 72" (the occupying zone or standing level); and finally the ceiling.

Much of the work in the larger room concerns such problems as what happens in the meeting of two currents of air and how low a ceiling outlet has to be for proper diffusion of its jet stream of air.

N. Y. HOTEL GETS UNIQUE CONDITIONING SYSTEM

The first complete, high-velocity electronic air conditioning system in a hotel is being installed in the Barbizon-Plaza in New York City, according to Jacob Schroeder, hotel president.

Costing over a million dollars, the revolutionary new cooling-heating system was developed by the Trane, Barber-Coleman, Minneapolis-Honeywell, and Westinghouse companies.

Fresh, outside air will be drawn in at the top of the 40-story building where it will be filtered, dehumidified, chilled to 46 degrees, and pumped rapidly down two main insulated 36" ducts. From here the air will be slowed down by diffusers and fed noiselessly to 1100 guest rooms through 2½ miles of small ducts. Stale air will be emptied outside the building.

Each guest room will contain a thermostat for individual control.

Heart of the chilling operation consists of two, 31,000-lb. Trane CenTraVacs, which will be hoisted to the top floor, where they will be installed. These are automatic, hermetically sealed, centrifugal compressors having 300 tons cooling capacity each.

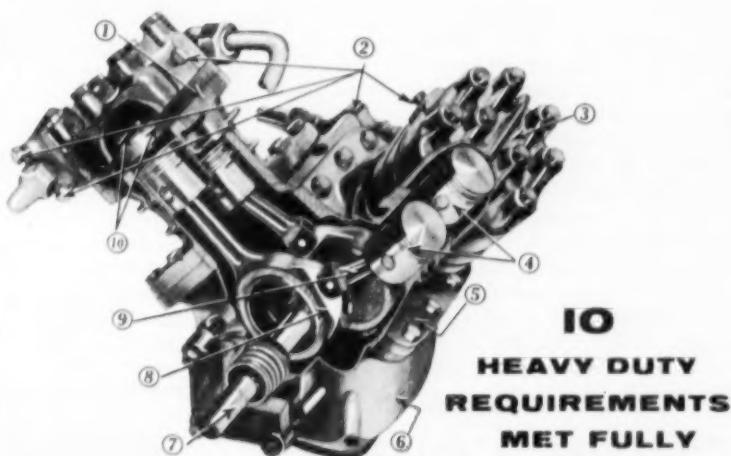
Chilling will be effected by constant recirculation of water mixed with anti-freeze and kept to 35 F.

Relative humidity of the air will be kept at 40%, as against 50 to 55% in earlier hotel air conditioning systems, Schroeder, said.

The intake of air from the outside of the building at the top will provide fresh air of maximum cleanliness for each room. The system also was designed to provide circulation of fresh, heated air in winter.

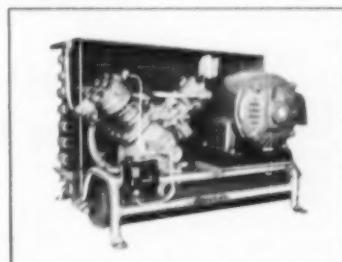
Jaros, Baum & Bolles were consulting engineers in collaboration with Abbott, Lester & Co., Inc., who are doing the installation.

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Don't shortchange that Heavy Duty Job!

Ask your Lehigh jobber to show you the new Lehigh units with this back-saver base. It not only chores off many pounds of useless dead weight but has many other advantages. It gives complete accessibility to all compressor and motor parts. It gives faster and greater sub-cooling by increasing the air-flow over the receiver. It makes inspection and cleaning easier. It adds rigidity and strength to the unit—and it is less costly to ship. Now on all heavy-duty models $\frac{1}{2}$ H.P. thru 1 H.P., air and water cooled. Coming soon $\frac{1}{2}$ thru 3 H.P.



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EXPORT DEPARTMENT, 12 E. 40TH STREET, NEW YORK CITY

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ICE MAKERS . . .

Continued from page 45

one year warranty period, of course, regular maintenance checks—usually every three months—should be made. And after the warranty period has expired, every effort should be made to sell the ice machine owner on a continuing maintenance contract. It's a good source of additional revenue for you, and it assures the owner that his equipment will remain in top operating condition.

Water scaling can be a major source of service difficulties, so every maintenance check should include the flushing out and washing of the water circuit, and inspection of this circuit for scale formation and precipitants.

Slight scale formation can be removed by circulating a solution of water and vinegar (approximately one quart to a full water pan) and following this with a thorough rinsing and flushing. More stubborn scale deposits can be dealt with by the use of de-

scaling solvents now on the market for such use.

Careful and thorough flushing after descaling is important. Thermostat bulbs in the water circuit should also be included in the de-scaling.

Many problems are created from scale formation, and they all add up to lower ice capacity and a dissatisfied user. For example, scale formation on the freezing tubes in some types of machines tends to "hold" the ice, preventing it from sliding down on the defrost, resulting in long defrost cycles; or, on occasion, the machine may go back to the freezing cycle while one of the tubes is still full of ice. If this occurs, the tube is frozen solid, and this will cause it to bulge, resulting in permanent damage.

Scale formation at the point of water entrance to the tube could cause premature ending of the freezing cycle by overflowing and causing the defrost cycle.

Modern automatic ice making equipment is coming into deservedly wider use, because it provides

a convenience of supply and a saving of money beyond anything that was available before. Careful engineering and assembly at the factory have done everything that can be done at that end to minimize service difficulties. By following a planned program of maintenance such as is suggested here, the refrigeration man can save himself needless trouble and heighten his customers' satisfaction with this equipment.

GE INCREASES PRICE 8% ON HERMETIC MOTORS

General Electric Co., has increased its price on all hermetic motors to 7" diameter, rated from $\frac{1}{2}$ hp and above. On the four pole motors a uniform increase of 8% will apply. On the newer line of two pole motors, the price increase ranges from a minimum of 8%.

The price increase reflects the effect of increased cost, according to Ab Martin, general manager of the company's hermetic motor department.

JOIN THE COLDIN CANALCADE



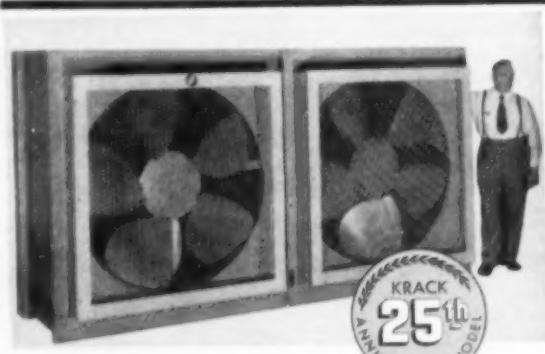
Every Size for Every Need for Every Food Retailer

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largest unit on the market new KRACK air cooled condenser

Now available in capacities up to 30 tons.
No need to use an oversize condenser.

SPECIAL FEATURES

1. Rust resistant
2. Semi-automatic belt adjustment
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Our readers have been chosen by their local Air Conditioning and Refrigeration Wholesalers to receive COMMERCIAL REFRIGERATION & AIR CONDITIONING because they are important factors in the merchandising, sales, installation and servicing of air conditioning and refrigeration equipment in their community. Their local air conditioning and refrigeration wholesaler pays us for their subscription.

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Editorial material is carefully planned and presented to help our readers do a better job and make more profits.



Commercial Refrigeration & Air Conditioning

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The Commercial Refrigeration & Air Conditioning

APPLICATIONS MANUAL

Residential Heat Flow Data Developing As Result of Austin Village Research

by Arthur H. Farr

FOR many years the time lag of heat transmission through various building materials has been well known, and accurate data has been published. The emphasis in the past has been on investigating the time lag related to construction most commonly found in commercial & industrial structures. Now — as a result of studies made at the Research Village in Austin, Tex. — data is being published on the heat flow through residential construction.

The test procedures used follow those used for the past several years by the Mobile Laboratory of the National Warm Air Heating and Air Conditioning Association in making similar surveys of residential installations. A substantial amount of instrumentation was placed in the house for from five to ten days to determine the general operating

CORRECTION

Our attention has been called to a major error in last month's Applications Manual article by Hugo C. Smith. The second sentence of the third paragraph should read as follows: "They had available a multiple-occupancy cold storage warehouse, with floor area of approximately 120 x 50'."

As it appeared in print, this sentence concluded with "... floor area of approximately 120 x 150'." Obviously this would be much too large an area to cool with two 7½-hp units as described in the article.

characteristics of the system under varying outdoor temperature and humidity conditions. This instrumentation, of the precision type, measured operations, humidity, wet and dry bulb temperatures, air velocities, and other pertinent measurable conditions. One day of the test period was designated "Datum Day" when additional instrumentation was installed for a stepped-up program of

automatically and manually recorded observations and readings. A "Datum Hour", usually between 3:00 and 4:00 of Datum Day, was selected for a still more intensive check of operational characteristics of the system with respect to the comfort conditions within the structure.

The general insulating quality of the house is indicated by the lag between peak temperatures indoors and out. See Fig. 1. Indoor peaks due to cooking, etc., at noon and dinner and outdoor ones due to temporary

fluctuations like cloudiness, wind direction, or showers are necessarily disregarded. Where local data is indeterminate, Weather Bureau temperatures are substituted.

The data covers 12 hours of the designated Datum Day, June 22, 1954. This was a day of normal summer weather when a shower occurred at 4:00 P.M. In Table 1, *Outdoor Air Temperature* was recorded in adjacent open shade, while *Sun Intensity* is the temperature recorded by a bare thermocouple centered in an inverted gold-fish bowl on the roof.

This method of measuring solar radiation, while not standard, gives an index or common denominator useful in comparing different houses. The glass enclosed thermocouple reacts to changes in solar radiation, wind velocity, and air temperature in a manner similar to the roof and wall surfaces of a house and should reach its maximum temperature at the same time as other surfaces exposed to the same sun and wind conditions.

Indoor temperatures were recorded 60" above the floor in the approxi-

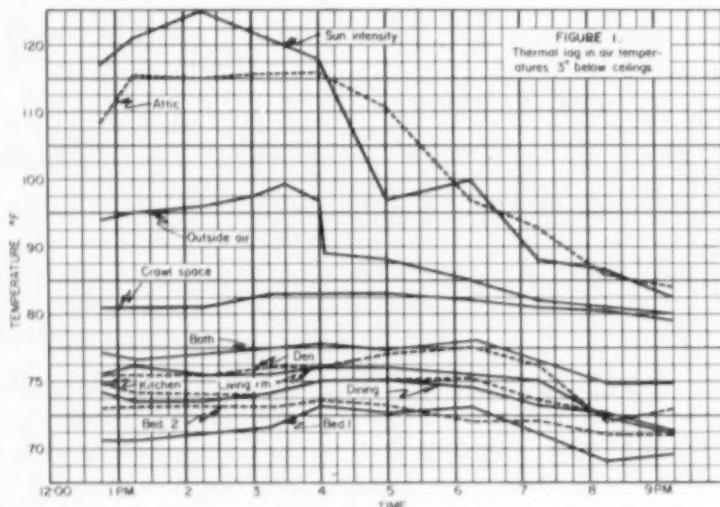


FIGURE 1
Thermal lag in air temperatures 3' below ceilings

TABLE 1: TIMING OF DATUM DAY PEAK TEMPERATURES

Outdoors	Sun Exposure	Intensity	Lag behind Sun Peak		Outdoor Air Indoors	Lag behind O.D. Air
			Indoors	Air Indoors		
Living-Dining Room	NE, SE	—	4:30	132 min	—	4:30
Kitchen	SE	—	5:15	177 min	—	5:15
Dinette	NW	—	5:00	162 min	—	5:00
Den	SW	—	4:00	102 min	—	4:00
Bedroom 21	SW, NW	—	4:30	132 min	—	4:30
Bedroom 22	SW	*	*	*	—	*
Bath 21	NE	—	6:15	237 min	—	6:15
Bath 22	NE	—	6:15	237 min	—	6:15
Average House Lag				168 min		91 min

*Temperature was uniform without significant peak.



Welcome News!

Easy-to-apply KWIKWRAP Tape from "VIRGINIA"

Yes, both old and new friends of "Virginia's" Presstite Insulation Tape will welcome the new Kwikwrap Tape, packaged in 30-in. flat strips for an easier, quicker, neater way of covering cold pipes to prevent condensation and stop dripping. Hot pipes up to 200°F. can be insulated, too. Kwikwrap is especially handy when space around the pipe or tubing is too limited to permit

passage of a regular roll of tape. Kwikwrap is applied horizontally (see photograph above).

Kwikwrap is supplied in six widths, each designed to exactly cover a specific tube or pipe size— $\frac{1}{2}$ to $1\frac{1}{8}$ inches OD. Strips are applied so that the end of one joins to the end of the one before it; they will self-seal when pressed together.

Width for $\frac{1}{2}$ in. OD Carton of 24 30-in. x 4-in. strips—
Width for $\frac{3}{4}$ in. OD sufficient for covering 60 lin. ft.

Width for $\frac{5}{8}$ in. OD Carton of 18 30-in. x 4-in. strips—
Width for $1\frac{1}{8}$ in. OD sufficient for covering 45 lin. ft.
Width for $1\frac{1}{4}$ in. OD
Width for $1\frac{1}{2}$ in. OD

Ask your wholesaler—or write us today for full details

HOW KWIKWRAP TAPE IS PACKAGED

Refrigeration Division
VIRGINIA SMELTING COMPANY
236 Jefferson St.
West Norfolk, Va.



ESOTOO • KINETIC CHEMICAL'S "FREON" REFRIGERANTS
V-METH-L • CAN-O-GAS • PERMAGUM • PRESSTITE TAPE • KWIKWRAP
SURISO REFRIGERATION OILS • WATER TREATMENT CHEMICALS
Available in Canada and many other countries

mate center of each room. Rooms are listed in approximate order of their exposure to the sun.

Thus, the house as a whole averaged a 2.8 hour lag behind sun heat, and 1.52 hours behind outdoor air. The 2½ Bedroom, Den and Living-Dining Room had thermal lags below average probably because of excess window area and their particular exposure, the former two also being subject to infiltration through occasional door opening. Conversely, the Dinettes, Kitchen, and baths apparently have thermal lags above average because of their particular exposure and reduced window areas.

Also illustrated in Figure 1 is the thermal lag through the roof and ceiling. The ceiling located near the SW wall in the Den reached its peak 3.95 hours after Sun Intensity, 2.67 hours after Outside Air and 3 hours after Attic Temperature. The temperature drop between Attic Air and the lower surface of the ceiling, averaged over 12 daytime hours, is 23.8° or 3.66° for each inch thickness of ceiling insulation.

In future articles, detailed information will be presented on heat flow through specific building materials with relation to sun exposure, etc.



FLOOR PLAN showing orientation of house in Austin Research Village used to test heat transmission through various residential structures.

SCHMITZ JOINS ALBANY PARTS WHOLESALER

A. M. Schmitz has been appointed sales manager of R. D. Marshall & Co., Inc., refrigeration and air conditioning supplies wholesaler in Albany, N. Y.

Schmitz previously had been affiliated with Servel, Inc., since 1929, serving as manager of the applications engineering department at the factory and as northeast district manager with headquarters at Albany.



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We don't mean to imply that your AIRSERCO distributor is some sort of a five-headed monster. We just want to say that he offers you five big pluses in the refrigeration and air conditioning field.

AIRSERCO for the finest . . .

- 1 instruments
- 2 equipment
- 3 replacement parts
- 4 charging panels
- 5 high vacuum pumps

Airserco has built more refrigeration testing equipment than any other company in the world.



AIRSERCO MANUFACTURING CO., INC.

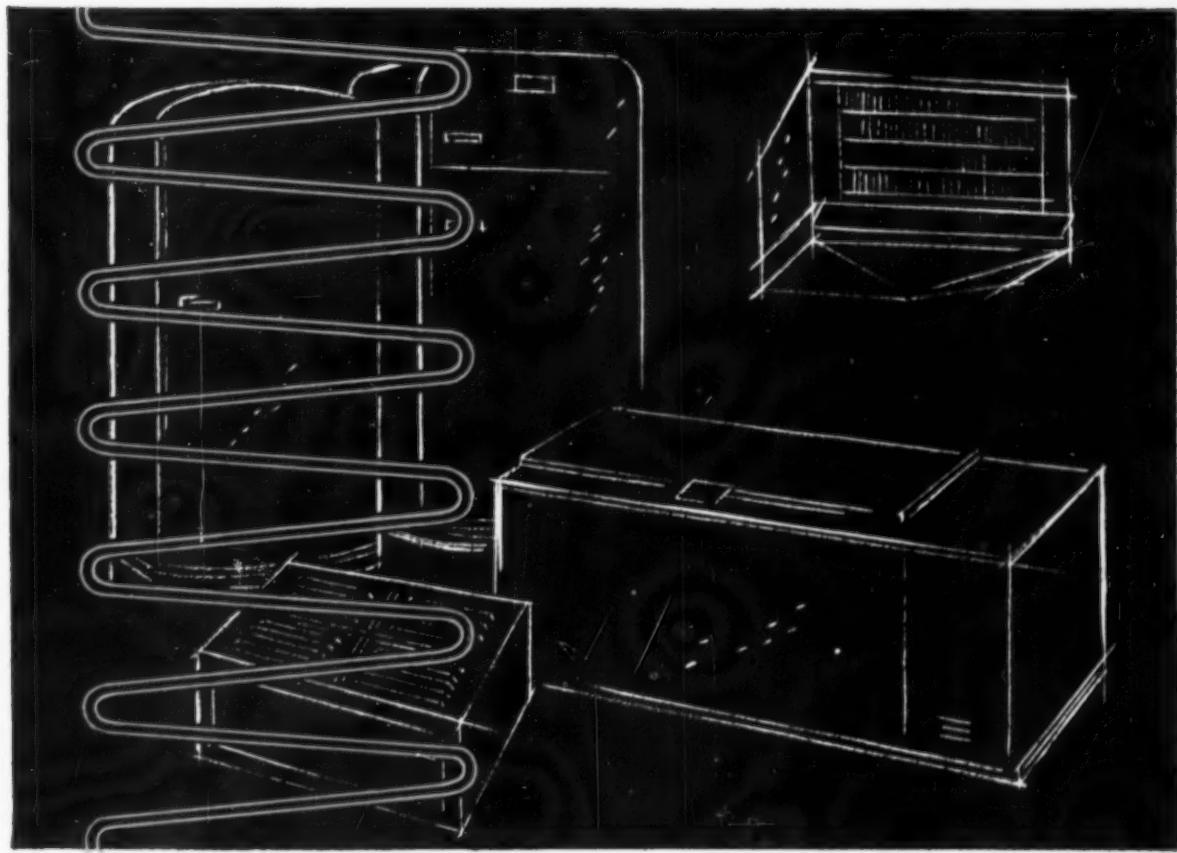
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Tubing Drawn by **PENN** is *Better!*

The uniform standards in wall, grain structure and temper in specified PENN Quality tubing and the vigilant watchfulness in protected shipments permit *more feet of usable tubing per pound* through less waste.

The friendly cooperation of the entire PENN staff to adjust themselves when the unusual happens and PENN'S faithful "on time" delivery which is *maintained in connection with definite and often times close production schedules* all adds up to a Plus that is pretty hard to evaluate in dollars and cents.

For over a third of a century now, PENN continues to lead the way in supplying better tubing from 1" O.D. to capillary .062 in straight—coiled—fitted—flared and fabricated forms for the Refrigeration and Air Conditioning markets. No matter what you do, if you need TUBING, you can do it BETTER with PENN Quality—Specify it.

Nothing quite matches this Penn trio. PENN uniform quality—PENN dependable trustworthiness and PENN friendly cooperation. Get to know them and you'll agree. Write direct or contact the PENN representative in your area.



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WISCONSIN	William Clark

Compressor Shipments Show 33% Increase

Manufacturers' shipments of compressor bodies used in air-conditioning and refrigeration units were up almost 33% during the first six months of 1956, as compared with the same period of 1955, it was revealed today by Geo. S. Jones, Jr., managing director of the Air-Conditioning and Refrigeration Institute. The figures, which do not include compressors used in household refrigerators, were compiled from reports made to ARI by manufacturers whose output is estimated to represent in excess of 90% of the industry.

Actual shipments for the six-month period totaled 2,806,882 units, compared with 2,117,891 units in first half of 1955. June shipments this year were 459,543 units, against 359,040 in June, 1955. These totals do not include compressors designed for use with ammonia refrigerants.

Of the six-month total for 1956, 167,487 of the compressor bodies shipped were of the type used in automotive air-conditioning. A comparative figure for the first half of 1955 is not available, but total 1955 shipments amounted to 255,371 units.

N. Y. OFFICE MOVED

Metals & Controls Corp. has moved its New York sales office to larger quarters at one East 42nd St., New York 17. The new office will serve both the General Plate Div. and the Spencer Thermostat Div. corporation.

JANITROL ESTABLISHES NEW ENGLAND BRANCH

Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., has established a new factory branch office and warehouse to serve New England. The office, at 281 Vassar St., Cambridge, Mass., will be managed by Max Tappero, who joined Janitrol in 1948.

Assisting him will be Chet McLaughlin and Hobie Baker, sales; George McDonald, warehouse manager.

Manufacturers' Shipments of Compressor Bodies

(Except for household refrigerators)

Shipments Including Exports (number)

	June, 1956	June, 1955
Horsepower*		
1/5 & under	47,172	294,326
1/4	72,070	463,389
1/3	24,155	181,641
1/2	45,680	265,367
3/4	83,614	528,476
1	87,220	483,289
1-1/2	33,679	200,131
2	8,097	47,049
3	13,571	77,043
5	9,853	58,220
7-1/2	4,883	26,428
10	1,022	5,549
15	320	2,117
20	305	1,569
25	246	1,023
30 & over	694	3,778
TOTAL	432,581	2,639,395
FOR AMMONIA REFRIGERANT—		
TOTAL	179	1,073
FOR AUTOMOTIVE AIR CONDITIONING—		
TOTAL	26,962	167,487
GRAND TOTAL	459,722	2,807,955

*For all refrigerants except ammonia (excluding units for automotive air conditioning).

Reporting Companies: Airtemp, Brunner, Carrier, Copeland, Curtis, Frick, Frigidaire, General Electric, Kelvinator, Lehigh, Servel, Tecumseh, Trane, Vilter, Westinghouse, Worthington, York.

This summary includes all compressor bodies shipped by the reporting companies regardless of whether they were shipped separately or incorporated into a condensing unit or unitary end-use product (such as a room air conditioner, display case, freezer, or commercial refrigerator). Shipments for export are included. Shipments for household refrigerators are not included.

In order to avoid duplication of reporting, shipment figures were requested only from companies that assembled the machined compressor casting with the components necessary to make a complete compressor or motor-compressor assembly.

DISTRIBUTES FRICK

Pappas Refrigeration Co. has been appointed an authorized distributor by Frick Co. Pappas has headquarters at Houston, and branches at San Antonio and Beaumont, Tex. The firm will cover the southern Texas area except in the vicinity around El Paso.

CALIFORNIA DAIRY USES "PACKAGED" ICE PLANT

The do-it-yourself trend has spread to the flaked ice field and has reached consumers whose uses range from 1,000 to 20,000 lbs. daily. Foremost-Golden State Dairies has installed such a "packaged" ice plant at Ventura, Calif.

The plant, which consists of an automatic ice-making unit, air-cooled condenser, galvanized steel-lined redwood storage bin with counterbalanced steel access doors, and refrigeration compressor unit in a weatherproof housing, was engineered and assembled by



Moore & Hanks, El Monte, Calif.

The plant is skid-mounted so that it may be easily moved from one location to another. All electrical circuits and controls are pre-wired and ready to run.

Use of these packaged ice plants by dairies and other quantity users of ice is said to result in much lower ice costs, besides eliminating bottlenecks in icing operations and assuring a dependable source of fresh, clean ice at all times.

M & H has worked out a lease arrangement, so that users can use this method to obtain tax benefits if they prefer, rather than purchasing the equipment outright.

AEC MAY BUILD FOOD IRRADIATION REACTOR

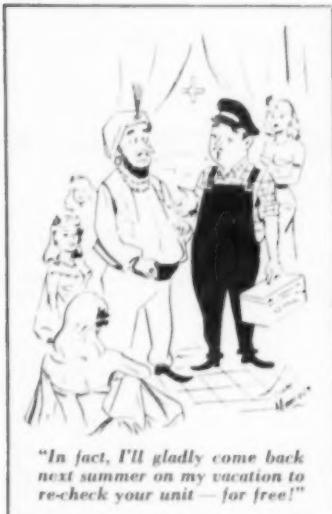
The Atomic Energy Commission has announced plans to invite proposals from qualified engineering and manufacturing concerns to participate in the design, development and construction of a proposed food irradiation reactor. This reactor would be used by the Army Quartermaster Corps for research in the preservation of food for the armed services.

ZONE YOUR SERVICE . . .

Continued from page 49

in the profit margin of our entire service operation."

Other benefits, too, are derived from the zoned service plan. United's management has found, for instance, that this system does much to improve customer relations. In the zoned system, the same men are continually calling on the same customers, in most cases handling their own callbacks. This makes for a more friendly relationship between the two, and results in a gradually growing feeling of confidence on the part of the customer toward the work performed by the serviceman.



"In fact, I'll gladly come back next summer on my vacation to re-check your unit — for free!"

From a sales standpoint, too, the zone service plan has proved beneficial. Because each serviceman gets to know his customers better, he is in a better position to anticipate their new equipment requirements. And if, through his repeated service calls, he has instilled in the customer the proper spirit of confidence, the customer is more apt to listen to the serviceman's recommendations.

To provide the proper sales incentive for their servicemen, the United organization offers them 2½% commission on all sales resulting from leads they turn in, and a full 5% if they actually

sell the equipment by themselves.

"The only possible drawback we have discovered with the zone service system," warns Boye, "is that it provides the opportunity for a serviceman to sell himself so solidly to his customers that he might be tempted to quit and go into business for himself with a "ready made" clientele. But if such a situation seems to be developing, it's always possible to transfer the man in question to another territory."

PENN CONTROLS FORMS NEW EXPORT SALES DIV.

Penn Controls, Inc., has established a new export division which will handle its international sales and distribution. The division will headquarter in North Bergen, N.J.

Max A. Coreth has been appointed manager of the new division. Coreth was associated, for several years, with various scientific and technical operations of the Navy Dept. both in the United States and abroad.

Circle No. 81 on Reader Service Card

ROTARY
SEAL

Replacement Units

Available in a wide size range for Commercial, Semi-Commercial, Air Conditioning and Home Refrigerators.

EASY TO INSTALL ★ ECONOMICAL



Edwards CO-AXIAL CONDENSERS

The NEWEST design in water-cooled refrigerant condensers.

Used by major equipment manufacturers because of these—

SELLING ADVANTAGES:

- Use 35% less water
- Cost reduced 30 to 40%
- Stock sizes: ½ to 7½ tons
- No internal joints
- Easy installation
- Many compact shapes
- Refrigerant charge reduced
- Shipping weight reduced

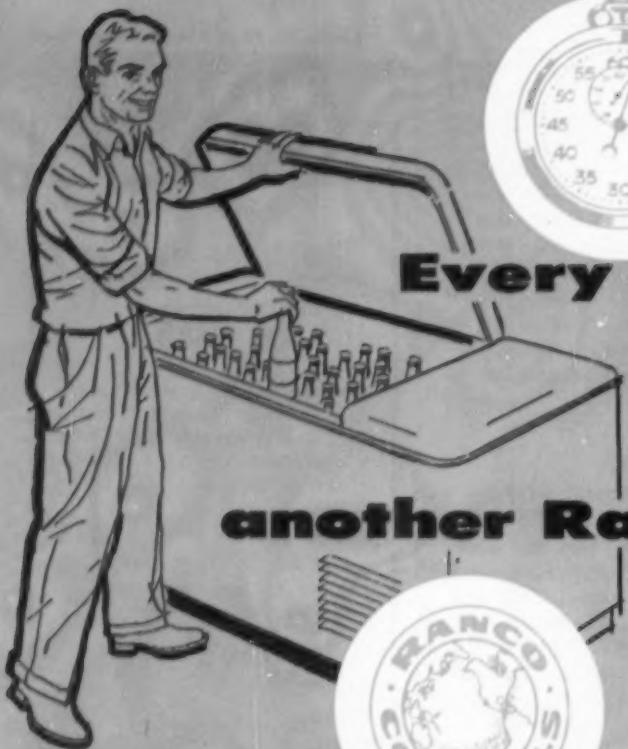
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TWO TYPICAL COMPACT EFFICIENT DESIGNS

WRITE, WIRE OR CALL TERHUNE 5-2808 TODAY!

EDWARDS ENGINEERING CORP.
300 ALEXANDER AVENUE • POMPTON PLAINS, NEW JERSEY

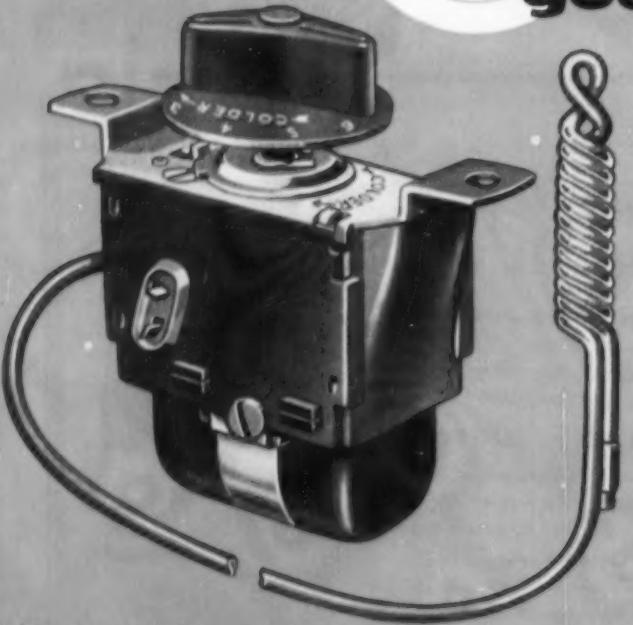


Every 3 seconds...

another Ranco control



goes into service



Ranco constant cut-in control, A12-1506,
for beverage coolers.

• Offers constant cut-in (factory setting) and dial adjustment of the cut-out setting.

• Manual OFF position on dial knob.
• Screw type terminals.
• 115, 208 or 230 volts AC.

Ranco Inc.

COLUMBUS 1, OHIO



Ranco replacement reference



No. 1544 lists nearly 5,000 Ranco Replacement Control applications, most complete line in the industry. Buy your copy from your Ranco Wholesaler. (Not available from factory.)

World's largest manufacturer of refrigeration controls

Here's How

PROFITABLE SERVICE AND INSTALLATION PRACTICES

How To Locate Troubles In Air Compressors

An air compressor of one kind or another is an essential piece of equipment in every well-equipped refrigeration or air conditioning service shop. But just like refrigeration compressors, air compressors too can get out of order. And sometimes the source of the trouble is mighty hard to find.

To help servicemen in properly

I DO IT THIS WAY

OCCASIONALLY I run into an open type unit that has been overcharged with oil. To simplify the job of removing the excess, I always carry with my equipment a milk dispenser hose, such as can be found at any dairy, corked at each end.

To use this handy tool I simply remove the corks, insert one end of the hose into the compressor body through the oil plug opening, and extend it into the oil to the depth of the level desired. Since this hose fits snugly into the plug opening, I then crack the low side service valve, letting into the compressor body enough pressure to force the oil up through the hose and out into a container.

By taking a measurement of the oil and marking on the hose the depth of the insertion, the correct oil level is obtained in the compressor. Upon removing the hose, the ends should again be plugged with corks to keep out dirt and moisture.

I also carry with me a funnel with a piece of 3/16" tubing soldered inside to by-pass pressure built up in the compressor body by leaking service valves. Using this funnel I can charge the unit with oil, and the oil will not blow back but will instead flow freely through the funnel while pressure escapes through the tubing.

Ed Patnik
Lander, Wyo.

maintaining this important item of their shop equipment, Worthington Corp., which makes air compressors as well as compres-

sors for refrigeration and air conditioning use, offers the following practical pointers on servicing *air-cooled* air compressors:

TROUBLE: Failure to deliver air.

LOOK FOR: Suction line blocked—dirty filter; valves improperly installed; suction valve unloaders stuck in unloaded position; strips missing from valves.

TROUBLE: Insufficient capacity.

LOOK FOR: Excessive leakage in pipelines and fittings and through valves; discharge pressure higher than rating; speed incorrect; filter clogged; worn piston and rings; faulty valves; blown cylinder head gasket; suction valve unloaders holding strips partially open; intercooler leaking; belt slipping.

TROUBLE: Insufficient pressure.

LOOK FOR: Demand greater than rated capacity of unit; speed incorrect; worn rings; excessive leakage in system and internally.

TROUBLE: Compressor overheats.

LOOK FOR: Broken valve strips; wrong direction of rotation; filter clogged; discharge pressure higher than rated; internal leakage; insufficient lubricating oil.

TROUBLE: Compressor knocks.

LOOK FOR: Loose flywheel or pulley; excessive wrist pin and bushing clearance; excessive crank pin bearing clearance; main bearings need adjusting; loose valve in cylinder; loose unloader; excessive end play in motor rotor; motor rotor shunting back and forth due to belt misalignment or uneven mounting.

TROUBLE: Compressor overloads motor.

LOOK FOR: Electrical characteristics of power lines incorrect; multi-V-drive belts pulled excessively tight; discharge pressure higher than rated; speed greater than rated; discharge line restricted; low voltage.

TROUBLE: Intercooler valve blows.

LOOK FOR: While running unloaded—broken or leaking high pressure discharge valve strip; high pressure unloader leaking air; defective or stuck low pressure unloader; blown high pressure heat gasket.

While running loaded—broken or leaking high pressure suction or discharge valve strip; high pressure unloader stuck in unloaded position; blown high pressure head gasket.

TROUBLE: Receiver safety valve blows.

LOOK FOR: Defective safety valve; safety valve set below cut-out pressure; defective pressure switch or trigger valve; pressure switch or trigger valve

set at too high cut-out pressure; leak in control line; inoperative suction unloaders.

TROUBLE: Compressor vibrates.

LOOK FOR: Not properly secured to foundation; improper foundation; piping not supported properly; shipping blocks not removed under base; motor rotor out of balance; one cylinder inoperative.

TROUBLE: Excessive oil consumption.



SOME time ago you published a suggestion from one of your readers on a method of adding a gauge port to a sealed unit by drilling a hole in the suction line and soldering in place a short length of capillary tubing.

To avoid the possibility of getting drill chips into the line, I have found it better to make the hole for this purpose with a well sharpened tapered punch. This is best accomplished if the punch is held at an angle with the tubing, as then it has less of a tendency to flatten the tubing when it is pounded. Also, the capillary will then enter the suction line at this same angle (A), and the hole will not have to be as large as if it had been drilled straight into the line (B).

John Kenna
So. Burlington, Vt.

LOOK FOR: Oil level too high; oil too light in viscosity; too high oil pressure (if force-feed lubricated); worn rings or cylinders.

TROUBLE: Unit blows fuses.

LOOK FOR: Fuses too small; low voltage; pressure switch differential too narrow; unit starting against full load; defective motor; compressor or motor binding.

(*Tips on servicing water-cooled air compressors will be published in a subsequent issue.*)

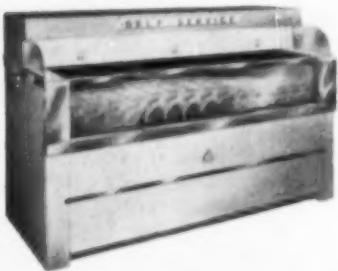


Circle No. 82 on Reader Service Card

DISTRIBUTORS!



**NOW you can get popular
FREEZ-RITE Display
Cabinets at Greater
Discounts!**



THROUGH EXCLUSIVE NEW

FREEZ-RITE SALES PLAN

Freez-Rite's new sales plan provides exclusive territories, longer discounts — means more profits for you!

And you'll have no trouble selling such exclusive Freez-Rite features as these; lower first cost, lower installation cost, lower operating cost, lower upkeep!

Write today for details on how you too can buy Freez-Rite Cabinets at larger discounts!

LOWER DEALER COSTS IN NEW DISTRIBUTOR PLAN

Send coupon for details

FREEZ-RITE

17172 REDFORD AVE., DETROIT, MICH.

Send full details on your new sales plan for distributors.

NAME _____

FIRM NAME _____

STREET _____

CITY _____ STATE _____

Circle No. 83 on Reader Service Card

110

M-H CONSOLIDATES HOME CONTROL SALES

Minneapolis-Honeywell Regulator Co. has consolidated its sales administration in the temperature-control business. Under the move, the Heating Controls Div. now will be known as the Residential Div.

It will have responsibility for the sale of all types of temperature-control equipment for homes, including electronic "Moduflow" which formerly was handled by the company's Home Products Div.

Activities of the new residential division will be directed by K. L. Wilson, M-H vice president.

LARGEST ABSORPTION UNITS COOL AIRPORT

New York International Airport's new "Terminal City" central air conditioning system will employ the world's largest installation of absorption refrigerating machines and will be one of the first in history to use the energy from hot water to produce cooling.

Charles V. Fenn, vice president, Machinery and Systems Division, said the contract for \$401,370 awarded by The Port of New York Authority calls for five of the big machines with a total cooling capacity of 3,500 tons.

The order is part of a 60 million construction program including individual terminal buildings capable of accommodating 140 aircraft at one time within a 655-acre landscaped area at New York International Airport.

DU PONT BRAZIL PLANT TO MAKE "FREON"

Du Pont do Brasil, S.A.-Industrias Quimicas, wholly owned subsidiary of the U.S. firm of E. I. du Pont de Nemours & Co., Inc., will begin manufacture of "Freon" refrigerants and aerosol propellants early next year at a new plant near Barra Mansa in Rio de Janeiro.

Initial production capacity will be in excess of Brazil's requirements for the fluorinated hydrocarbon compounds over the next five years.

Until this time, all of the "Freon" compounds sold in Brazil have been imported from the U. S.

Circle No. 84 on Reader Service Card

MAKE EXTRA PROFITS



KOCH CATALOG

Sell equipment and supplies to:

- MEAT PACKERS
- LOCKER PLANTS
- MEAT MARKETS
- INSTITUTIONS
- SAUSAGE MAKERS
- MEAT WHOLESALERS
- POULTRY PLANTS

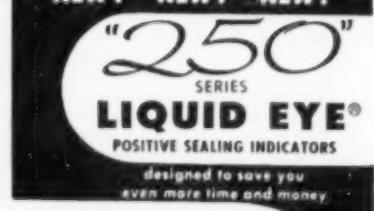
This new illustrated Koch Catalog is your stock and show room. Koch free engineering service and "know how" will help you sell.

Write Today for Your Copy of
1957 Koch Catalog \$8 and Dealer Plan.

KOCH Supplies

2518 S. Holmes Ave. Kansas City 8, Mo.

NEW! NEW! NEW!



6 sizes now available: 2⁸, 1⁷, 4⁶, 7⁸, 11⁸, and 13⁸ O.D.s

The new "250" has all the proved Liquid Eye advantages plus these newly engineered features:

- smaller—more compact, simplified design.
- preformed copper extension eliminates need for separate gaskets—foolproof installation.
- complete, self-contained, economy unit.

Ask your wholesaler now.

Write today for catalog covering the complete Allin line.

ALLIN MANUFACTURING CO.
410 N. Hermitage Ave.
Chicago 22, Ill.
Over 1,000,000 Liquid Eyes Sold to Date!

Circle No. 79 on Reader Service Card

NOVEMBER, 1956 • COMMERCIAL REFRIGERATION

WORTHINGTON ACQUIRES WEST COAST PLANT

Worthington Corp. has announced the acquisition of a west coast manufacturing plant in Alhambra, Calif., as a further step in the company's expansion in the year-round home air conditioning field. The plant was acquired from Royal Jet, Inc.

The facility will be operated as the Western Air Conditioning Div. of Worthington. Its products will include warm air furnaces and air handling equipment for year-round air conditioning systems designed to fit the climatic conditions of the western and southwestern states.

RODGERS ENGINEERING BUILDS NEW FACILITIES

Rodgers Engineering Co., north Texas distributors for Mueller Climatrol and Kennard air conditioning equipment and accessories, has constructed a new office and warehouse at 1925 Record Crossing, Dallas. The building contains 6000 sq. ft. of office and display space.

Calendar of Industry Conventions

Nov. 13-15	Institute Of Boiler and Radiator Manufacturers (Fall Meeting)	
Nov. 13-16	National Association of Ice Industries (Annual Convention)	Atlanta, Ga. Biltmore Hotel
Nov. 15-18	Refrigeration Service Engineers Society (Annual Meeting)	Kansas City, Mo.
Nov. 25-28	American Society of Refrigerating Engineers (Semi-Annual Meeting)	Boston, Mass. Hotel Statler
Nov. 26-28	Refrigeration and Air Conditioning Contractors Assn. (Annual Meeting)	Miami Beach, Fla. Balmoral Hotel
Nov. 27-30	National Warm Air Heating and Air Conditioning Association (Committee Meetings and Annual Convention)	Cincinnati, Ohio Netherland Plaza Hotel
Dec. 3-4	National Commercial Refrigerator Sales Assn. (Annual Meeting)	San Francisco, Calif. Mark Hopkins Hotel
Feb. 25-March 1, 1957	American Society of Heating and Air-Conditioning Engineers, Inc. (Annual Meeting)	Chicago, Ill. Conrad Hilton Hotel
Feb. 25-March 1, 1957	International Heating and Air Conditioning Exposition	Chicago, Ill. Intl. Amphitheatre
Nov. 18-21, 1957	10th Exposition of Air Conditioning & Refn. Industry	Chicago, Ill. Intl. Amphitheatre

THE *Dunkill* "MIXOMATIC"
**SOFT DRINK
DISPENSER**

Dispenses mixed carbonated drinks
AUTOMATICALLY!

Completely self-contained and available with two to four Mixomatic arms to serve two to four carbonated flavored beverages plus plain carbonated soda.

- Automatically serves carbonated mixed drinks at uniform flow and with exact amount of syrup.
- Dispensing tower has syrup and soda lines internally refrigerated to point of delivery.
- Revolving transparent display merchandiser mounted on top of dispensing tower.
- Two beverage unit delivers 150 drinks per hour.
- Three and four flavor unit produces up to 380 drinks per hour.
- Stainless steel top and front—double baked enamel exterior.
- Eliminates handling of bottles and saves money by producing finished drinks at less than half the cost of bottled drinks.

Write for descriptive literature

THE DUNKILL SODA FOUNTAIN CORP.

79-85 Walworth Street, Brooklyn 5, N. Y., MAin 5-4004
Export Dept. 39 Broadway, New York 6, N. Y.

Circle No. 86 on Reader Service Card
& AIR CONDITIONING • NOVEMBER, 1956

for installation of **DUCT INSULATION USE TUFF-BOND M-102-H ADHESIVE**

A Superlative-Economical product

Other outstanding products for the insulating contractor:

- ★ Tuff-Weld (nylon) insulation hangers
- ★ Gemco (metal) insulation hangers
- ★ Tuff-Bond general purpose adhesive
- ★ Tuff-Bond Quik-Set Adhesive
- ★ Tuff-Bond #500 (a high heat resisting adhesive)

Ask for descriptive literature and prices

GOODLOE E. MOORE

INCORPORATED
DANVILLE 25, ILLINOIS

Circle No. 85 on Reader Service Card

"SCOTSMAN" SHOWROOMS VISIT PROSPECT'S FRONT DOOR



TRAVELING SHOWROOMS help to bring ice machines right to the prospect's door for Waters Equipment Co., Tampa, Fla., distributor for Scotsman ice cubers and flakers. The distributor has both truck showrooms at work in his territory which covers sales and service outlets in Daytona Beach, Gainesville, Orlando, Fort Meyers, St. Petersburg, Sarasota and Perry. The sparkling white trucks carry advertising messages on all four sides. They are supplemented with a white passenger car used for sales and service calls to dealers.

CARRIER PAYS FOR ENGINEERS' DEGREES

Many engineers employed by Carrier Corp., now will be able to obtain advanced degrees in mechanical engineering from Syracuse University College on a part-time basis and without cost. The corporation assumes all expenses for the 3½-year program for participating students, according to Cloud Wampler, carrier board chairman.

Some 25 engineers engaged in research, development, and manufacturing activities for Carrier are enrolled in the initial phase of this post graduate training program.

"LOOK! HERE'S HOW!" IS CONVENTION THEME

"Look! Here's How!" has been selected as the theme for the 43rd annual convention of the National Warm Air Heating and Air Conditioning Association, to be held on Wednesday and Thursday, Nov. 28 and 29, at the Netherland Plaza Hotel in Cincinnati.

Convention program has been designed to mirror the industry, its goals, and its problems, particularly as reflected at the dealer level.

The "how" of selling will be featured on the convention program in such subjects as "Why Do People Buy?"—a description

of consumer buying habits and customs, by Irving Gilman, of the Institute of Motivational Research, and "Why Do People Buy Air Conditioning?", which will point out some of the interesting findings of a recent survey of the attitudes and thinking of people who have bought central air conditioning.

Robert D. Strickler, director of sales for Lennox Industries, Inc., will discuss the important subject of "Selling to the Public."

Dean Emeritus Lorin G. Miller, formerly of Michigan State University, will summarize the session with the admonition: "Be Ready to Sell."

The overall business picture for the coming year will be given by Arthur M. Weimer, Dean of the School of Business, Indiana University, who will discuss "The American Economy and the Home Building Picture."

Arrangements are being made to obtain an authoritative speaker to provide suggestions on "How to Sell the Builder."

The vast potentials which exist in the home modernization market and the national promotion program which is developing these potentials will be described by John Doscher, executive director of Operation Home Improvement, as he discusses "Operation Home Improvement for 1957."

Randall A. Nelson, director of public relations for the National Warm Air Heating and Air Conditioning Association, will evaluate how the industry can capitalize on its own part of this giant modernization market through the use of the industry's own promotion program—Operation "WHAM."

In his presentation "Know Your Costs" Wilfred L. Dulle, executive vice president of the E. E. Souther Iron Co., St. Louis, will provide dealers with some methods and procedures for establishing accurate cost-evaluations in their business operations.

Dulle will demonstrate to dealers how to arrive at a selling price which will guarantee them a legitimate profit.

BOOK REVIEW

Title: Successful Meat Smoking (Third Edition)

Publisher: Koch Supplies, Kansas City, Mo.

Price: 25 cents

A practical booklet to help smokehouse operators get best results, and of general benefit for the food industry. Deals only with smokehouse procedure.

Based on observations of how actual users operate smokehouses. Explanations are furnished by Koch engineering staff. Information is highly concentrated, and presented without superfluous wordage. Small and factual, basic engineering principles for many customs are stated. Contains special sections on smoking hams, bacon, sausage, poultry, cheese, and fish.

A chapter titled "Future Developments" discusses the electrolytic deposition of smoke and suggests that the use of radio-active isotopes in smokehouses is very probable and that eventually a system will be worked out so that these by-products of the atomic piles can be used to increase the keeping quality of smoked foods.

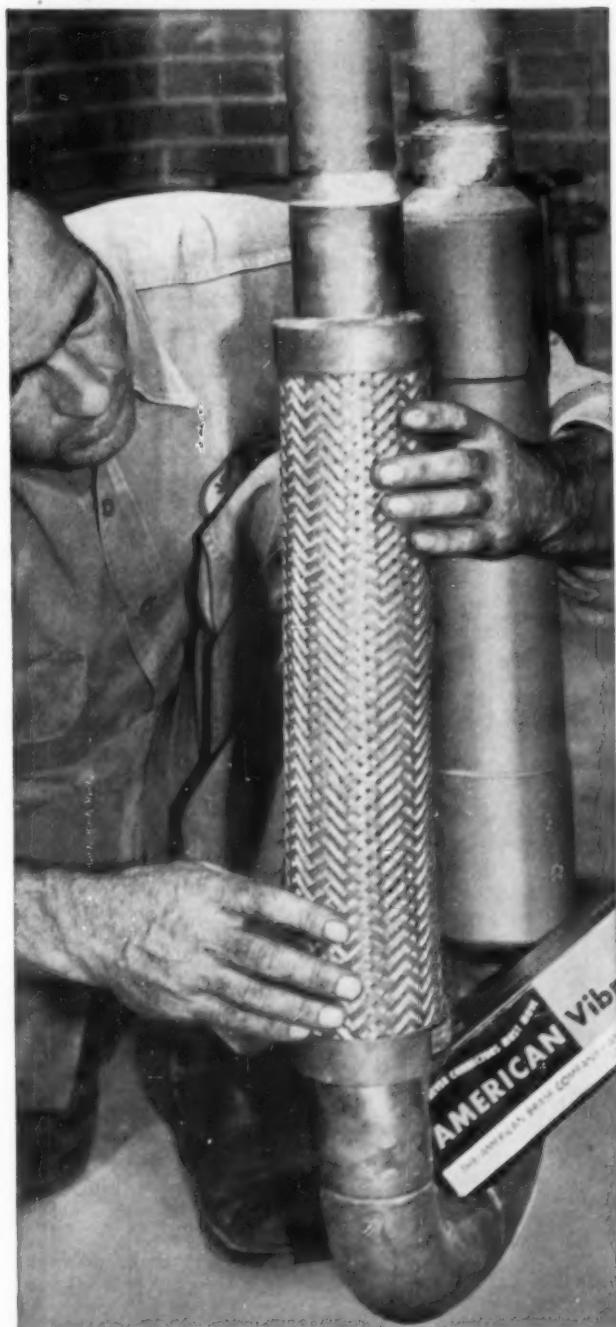
BRANCH OFFICE MOVED

National-U.S. Radiator Corp. has moved its Washington, D. C. branch sales office and warehouse from 4034 Georgia Ave., N. W., to 6310 Chillum Place, N. W.

The new local headquarters for the company's heating and air conditioning division contains about 4,000 sq.ft. of floor space.

"We place our confidence in the performance of American Vibration Eliminators . . ."

reports JOE HOPPE, Inc., Dallas, Texas



SERVICE REPRESENTATIVE A. C. Lewis examines 2½" American VE used on hot gas line. 2½" VE's on the suction line handle the cold gas—thus VE's reduce vibration and noise on both sides of unit.

"In the system we recently installed at Gulf Industries, Inc., (manufacturers of aircraft parts) Grand Prairie, Texas, gas is compressed from a 4" expansion to a 2" compaction. Without American VE protection, the rigid pipe lines in the system, especially those near motors and compressors, would have no give . . . connecting joints would break and leak . . . costly refrigerant would be lost . . . and vibration would cause nerve-racking noise.

"Since their installation, American VE's have performed their job in their *usual* efficient way . . . making the entire system tight. In fact, we've used American VE's for the past 6 years and we've never seen one fail to function properly. The tougher the job, the greater the reason to use *American* VE's, we say."

You can use AMERICAN VE's with confidence because—

The right metal does the job. The special tin-bronze alloy—the result of American Brass metallurgical know-how—is tailored for the refrigeration and air conditioning industries.

Double braid where extra protection is needed. On all American VE's 2½" O.D. and larger.

Clean, dry, tested, protected. Snip the end of the vapor-proof polyethylene bag and you have a factory-fresh unit to install in the line . . . clean, inside and out!

Packaged for your convenience, protection. The new boxes are sturdy, easy to open, easy to identify. Insist on VE's with the stamping "American" on the ferrule . . . an Anaconda product.

60209



NOW LISTED BY
UNDERWRITERS' LABORATORIES
THROUGH SIZES 3½" O.D.

FOR DESCRIPTIVE FOLDER WRITE: The American Brass Co., American Metal Hose Division, Waterbury 20, Conn. In Canada: The Canadian Fairbanks-Morse Co., Ltd.

WHEREVER CONNECTORS MUST MOVE

AMERICAN

For American Vibration Eliminators

see your

ANACONDA®
DISTRIBUTOR

Handy Tube Bender

**Smoothly Bends ANY
Pipe or Tubing**

$\frac{3}{8}''$ to $1\frac{1}{8}''$ O.D.



• Just a twist of the wrist assures perfect, even bends . . . right-angle, any angle. U and offset—every time. Eliminate need forels. No more guesses—no kinks! Save enough time, labor and money on ONE job to pay for your Handy Bender.



HOLSCLOW BROS., INC.
430 N. WILLOW ROAD — EVANSVILLE, IND.

COMMERCIAL SALES . . .

Continued from page 50

Inventory figures reported by these same distributors as of June 30, 1956, showed an average increase of 28.07% over the same date in 1955, while accounts receivable showed an average rise of 12.33%.

NCRSA RANKS SWELL

Three new distributor members have been added to the membership of the National Commercial Refrigerator Sales Association, and two manufacturing firms have joined the organization as associate members.

The new distributor members are: Birkenwald Equipment Co., Portland, Ore.; Champe Webb Refrigeration Co., Charlotte, N. C.; and Consolidated Services, Inc., Seattle, Wash.

The new associate members are: Spee-Dee Checkout Systems, Inc., Grand Rapids, Mich.; and Robert Becht Co., Cincinnati, Ohio.

ICE-FLAKING MACHINE PATENT TO BE LITIGATED

A suit alleging infringement of United States Letters Patent No. 2753694 has recently been filed in the United States District Court in Chicago.

The American Gas Machine Co., Inc., manufacturers of "Scotsman" ice machines, of Albert Lea, Minn., the owner of the patent, is alleging that the ice flake making machines manufactured and sold by the Cold Corp. of Chicago constitute an infringement of this patent. The case has been assigned to Judge Knoch, although the trial date has not been fixed.

SWEDEN FREEZER NAMES 13 NEW REPRESENTATIVES

Sweden Freezer Mfg. Co. has appointed 13 new representatives.

Named to handle the company's line of soft serve ice cream and milk shake making equipment are Markman-Brown, Inc., Montoursville, Pa.; Sweden Freezer Sales of Delaware Valley, Philadelphia; Jerome J. Altman, New York City; Joseph S. Karp and Bros., Cumberland, Md., and Altoona, Pa.; Midwest Restaurant Equipment Co., La Crosse, Wis.; Refrigeration Engineering, Inc., Sioux City, Iowa.

Hephfinger Bros., Store Fixtures, Inc., Cincinnati; Harry Harris Store Fixture Co., Paducah, Ky.; M. E. Stern & Co., Norfolk, Va.; H. A. Redmond Co., Cleveland; Hiawatha Chef Supply, Escanaba, Mich.; Millerlei Novelty Co., Evansville, Ind.

Frosty Refrigeration Co., Inc., Cantonsville, Md.; and R. & R. Refrigeration Service, Omaha.

PORT MORRIS EXPANDS

Port Morris Machine & Tool Works, Inc., has established a second assembly plant especially for manufacture of its new Electro Freeze Super Shake model. Unit has spindle going right through head of compressor enabling operator to make milk shake in any of three flavors, in four seconds.

**BUY FROM YOUR
REFRIGERATION WHOLESALER**

New Ice! New Markets! New Profits!

New Lipman Air-Cooled

ICE BOY CHIPPER



Produces New Form of Hard Ice!

Ice particles—not flaked or crushed. Crystal-clear, diamond-hard. Set up well for banking food displays. Cool soft drinks, without getting slushy.

Gives You More Prospects!

A year-round market—and about six times bigger than for cubes! Opens the door to new sales in drugstores, drive-ins, cafeterias, restaurants, hospitals, institutions.

Big Producer in Small Space!

Full 250-lb.-capacity bin. Only 24 inches wide.

Send coupon for further information.

A sign of good ice

LIPMAN DIVISION
Since 1917



TEAR OUT COUPON AND MAIL TODAY!

LIPMAN DIVISION, Yates-American
Dept. M, 771 N. Fourth St., Beloit, Wisconsin
The LC-80 Ice Boy sounds like a real money-maker.
Send me more facts about it.

Name _____

Company Name _____

Address _____

City _____

Zone _____

State _____

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WITT *Air Cooled Condensers*

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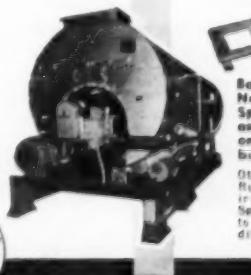
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